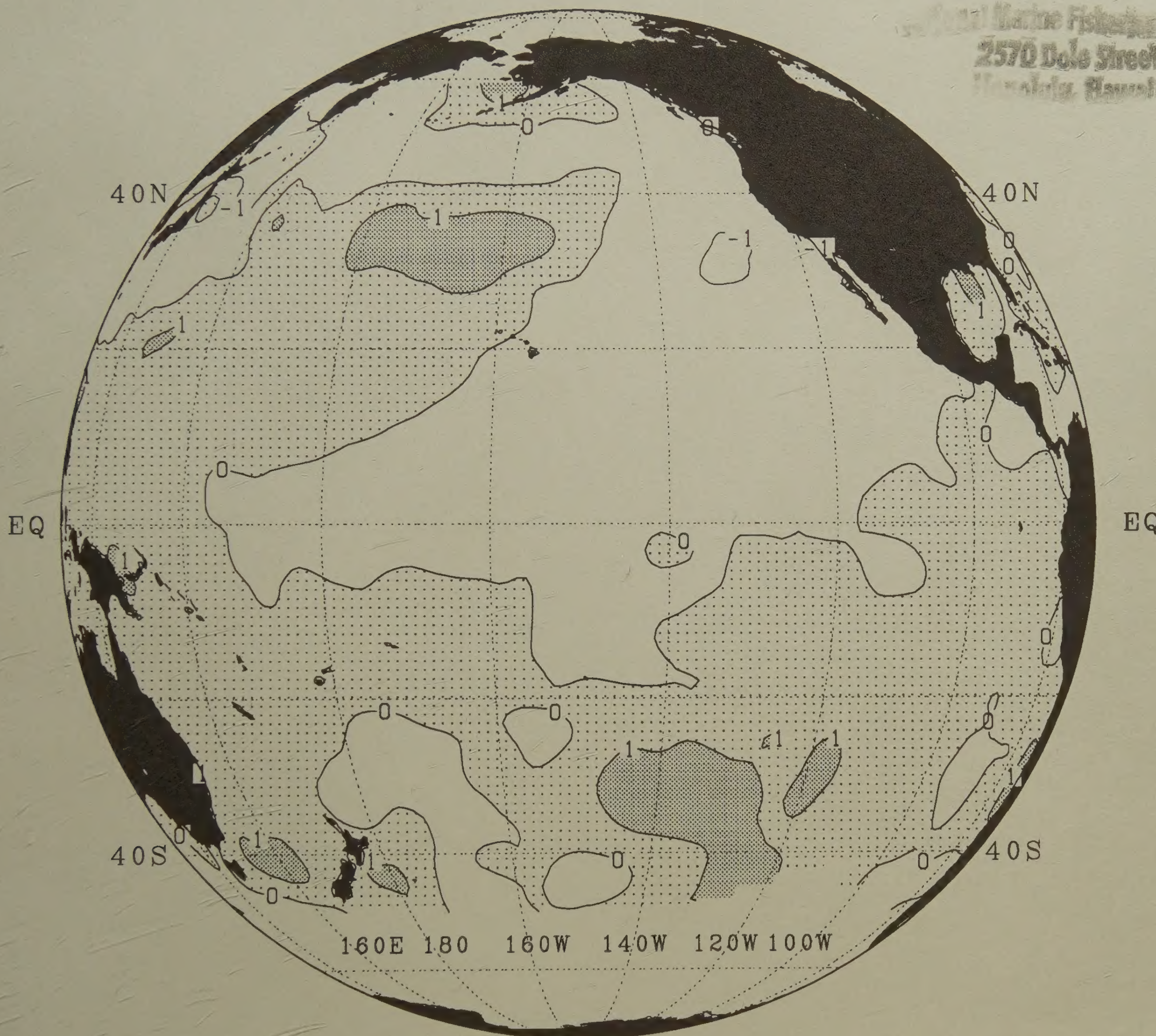
気象庁海洋月報

Monthly Ocean Report
April 2001 (No. 100)



Climate and Marine Department
Japan Meteorological Agency

気象庁 気候・海洋気象部

平成13年4月

気象庁海洋月報は、気象庁 気候・海洋気象部 海洋気象情報室で作成しています。
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Monthly Ocean Report is prepared by the Office of Marine Prediction, Climate and Marine Department, Japan Meteorological Agency.

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表紙は、2001 年 4 月の太平洋の月平均海面水温偏差図です。
陰影部は、平年より高温の海域を示しています。

The figure on the front cover shows the monthly mean SST anomalies for April 2001 in the Pacific Ocean.
Areas of positive anomalies are shaded.

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海況の特徴（２００１年４月）

日本近海の海況

海面水温は、三陸・常磐沖を除いて全般に低く、40°N 以北で平年より 1℃以上、東海沖から南西諸島、及び九州周辺で平年より 0.5℃以上低かった。一方、三陸沖の 39°N、146°E 付近では平年より 1℃以上高かった（第４図）。

黒潮は、東海沖で離岸し、32°N、139°E 付近まで南下した後、八丈島の西を北上し、上旬は三宅島の南で東北東に向きを変えた後、141°E 付近で再び北に向きを変え犬吠埼沖に達していた。中・下旬は三宅島付近を通った後、房総半島の東を北東に流れていた（第９図）。

太平洋の海況

太平洋赤道域の海面水温は、125°E から 150°E にかけてと 110°W 付近及び 90°W 付近で、平年より 0.5℃以上高かった。一方、150°W 付近では平年より 0.5℃以上低かった。フィリピン周辺海域では平年より 0.5℃以上高かった。

北太平洋の海面水温は、35°N 付近の日付変更線から 155°W にかけて平年より 1℃以上高かった。一方、20°N から 45°N の 140°W 以東と、45°N を中心とした 150°W 以西では平年より 0.5℃以上低く、40°N から 50°N の 160°E 以西では - 1℃を超える負偏差が見られた（第１７図）。

Highlights April 2001

Seas adjacent to Japan

SSTs were generally below normal except the seas off Sanriku and Joban. SSTs were more than 1℃ below normal north of 40°N and more than 0.5℃ below normal from off Tokai to the Nansei Islands and around Kyushu. Positive SST anomalies exceeding +1℃ were found near 39°N, 146°E off Sanriku (Fig. 4).

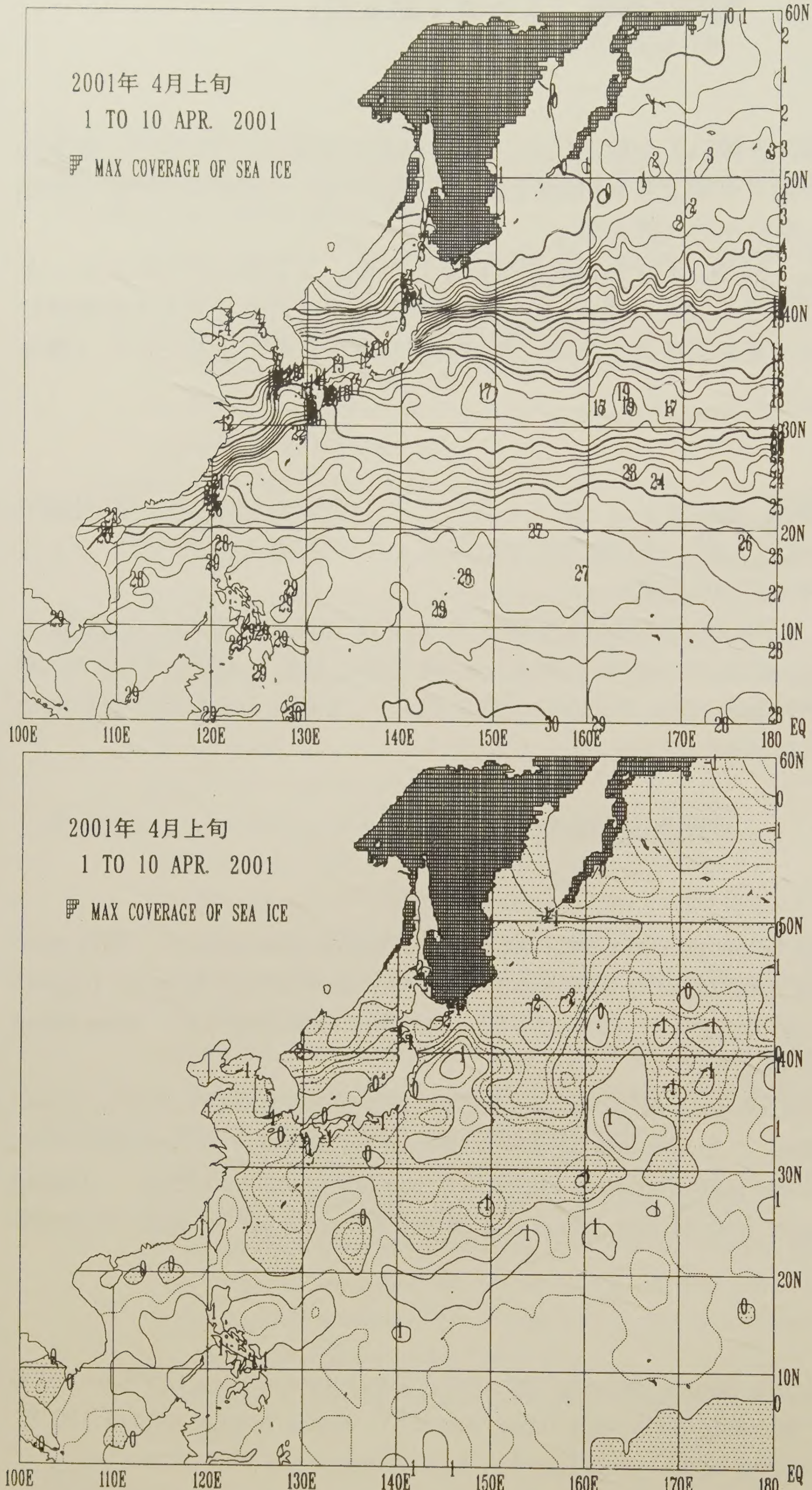
The Kuroshio flowed SE-ward off Tokai and turned to the north at 32°N, 139°E, it then flowed west of Hachijo Island. In the first 10-day period of the month, it turned ENE-ward south of Miyake Island, it turned northward near 141°E, and then flowed off Inubozaki. During the rest of the month, it passed near Miyake Island and flowed NE-ward off the Boso Peninsula (Fig. 9).

Pacific Ocean

In the equatorial Pacific, SSTs were more than 0.5℃ above normal from 125°E to 150°E and around 110°W and 90°W, while SSTs were more than 0.5℃ below normal around 150°W. Positive SST anomalies exceeding +0.5℃ were found in the seas around the Philippines.

In the North Pacific, SSTs were more than 1℃ above normal from the dateline to 155°W along 35°N. SSTs were more than 0.5℃ below normal east of 140°W between 20°N and 45°N and west of 150°W along 45°N. Negative SST anomalies exceeding -1℃ were found west of 160°E between 40°N and 50°N (Fig. 17).

Ten-day mean SST & Anomalies



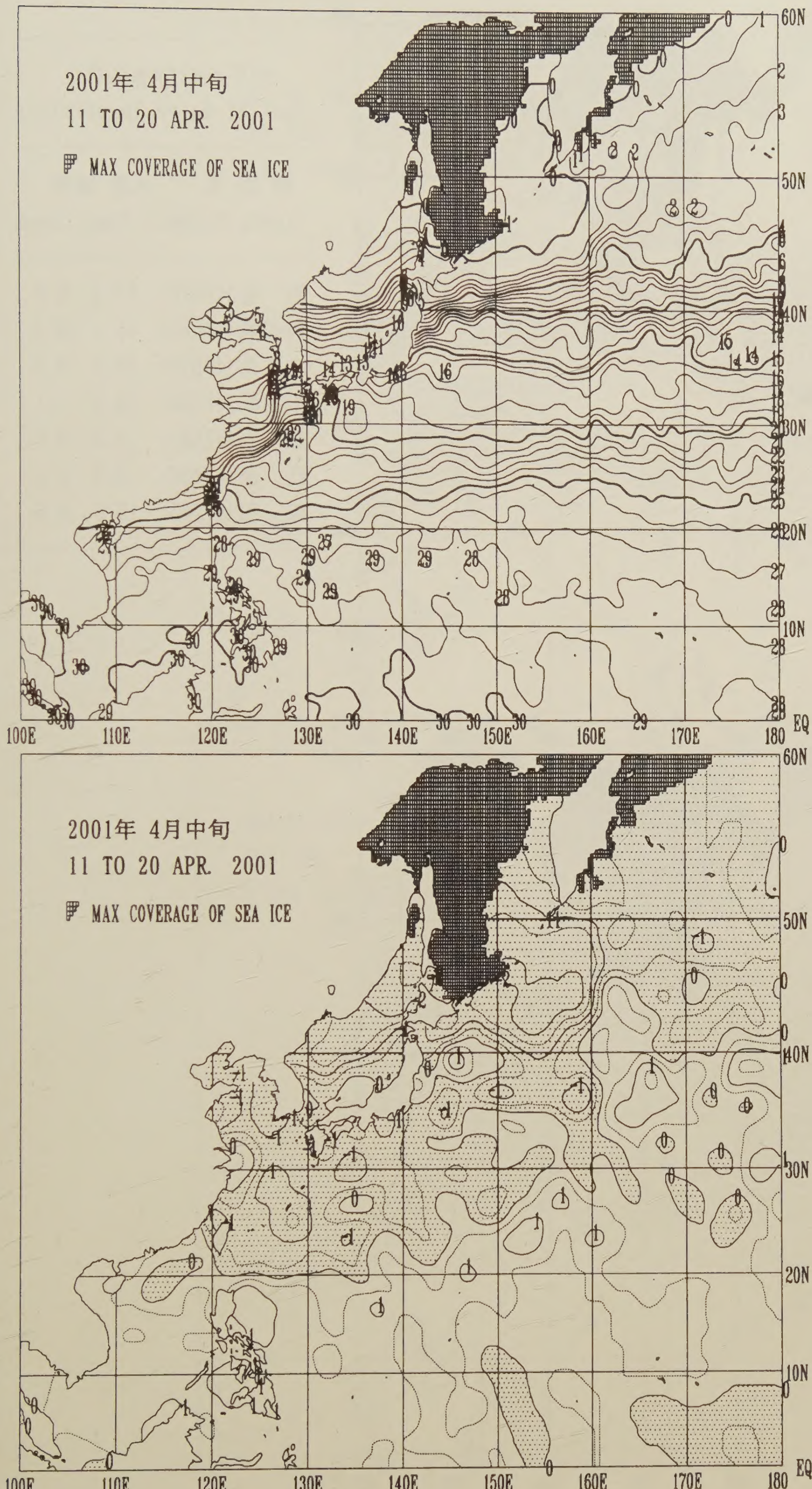
旬平均沿岸水温 (℃)
Coastal Water Temperature

地点名 (Index Number)	水温 Temp.	偏差 Anom.
石　垣 (47918)	23.5	0.2
御前崎 (47655)	13.8	-0.5
八丈島 (47678)	18.4	0.4
小名浜 (47598)	8.2	-1.5
宮　古 (47585)	6.5	-0.1
江　差 (47428)	7.1	-0.4
浜　田 (47755)	13.9	0.3

第1図 北西太平洋旬平均海面水温図(上)及び偏差図(下) (2001年 4月上旬)

Fig. 1 Ten-day mean SST (top) and anomalies (bottom) in the western North Pacific for the 1st ten-day period in APR 2001. Anomalies are computed from the JMA climatology (1971-2000). Contour interval is 1°C and additional anomaly contours of 0.5°C are shown by broken lines. Negative anomalies are spotted.

Ten-day mean SST & Anomalies

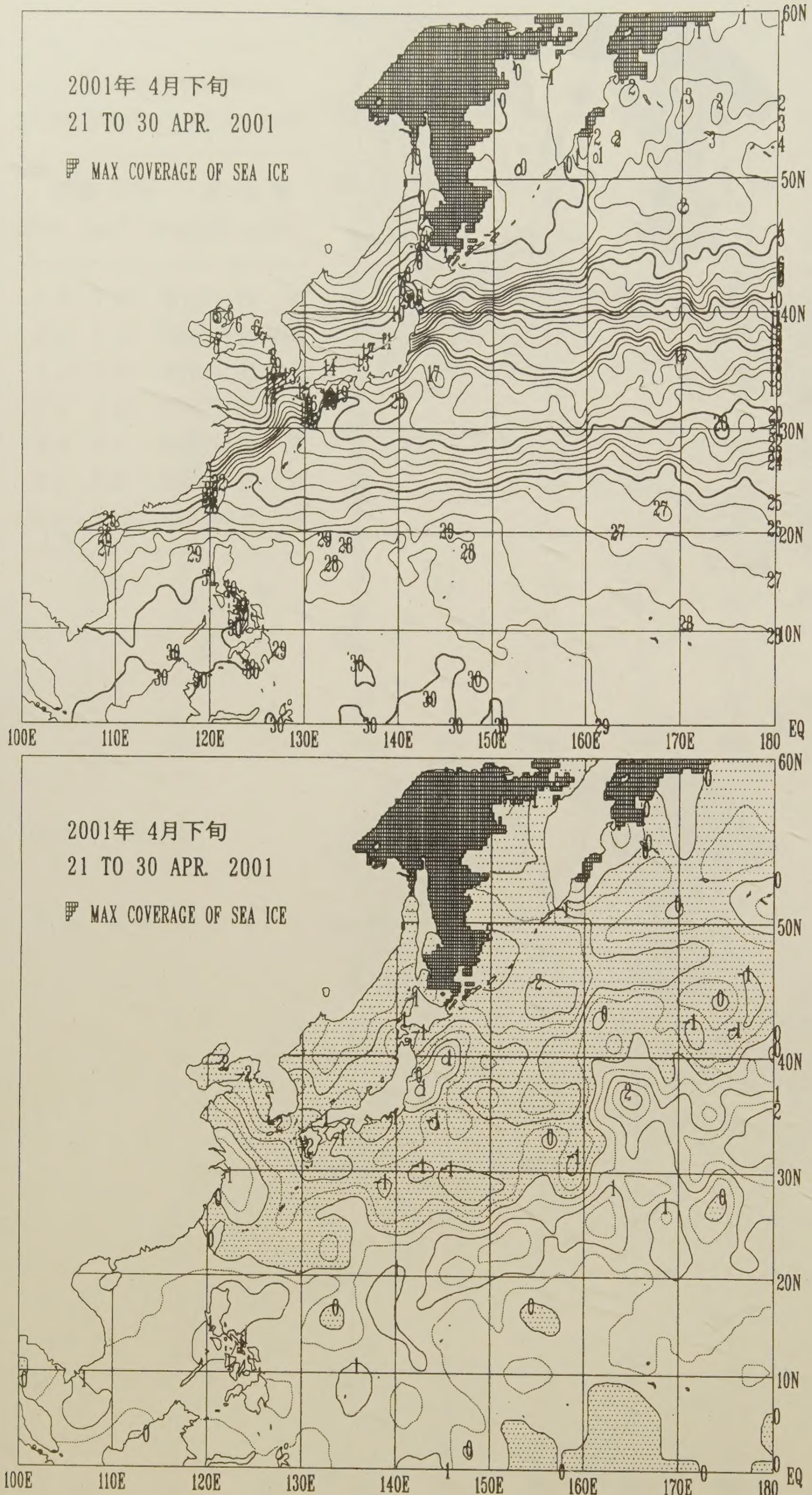


旬平均沿岸水温(℃)
Coastal Water Temperature

地 点 名 (Index Number)	水温 Temp.	偏差 Anom.
石　垣(47918)	23.7	-0.4
御前崎(47655)	15.5	0.0
八丈島(47678)	18.7	-0.1
小名浜(47598)	10.5	-0.3
宮　古(47585)	7.3	0.2
江　差(47428)	9.3	1.0
浜　田(47755)	15.2	0.9

第2図 北西太平洋旬平均海面水温図(上)及び偏差図(下) (2001年 4月中旬)

Fig. 2 Ten-day mean SST (top) and anomalies (bottom) in the western North Pacific for the 2nd ten-day period in APR 2001. Anomalies are computed from the JMA climatology (1971-2000). Contour interval is 1°C and additional anomaly contours of 0.5°C are shown by broken lines. Negative anomalies are spotted.

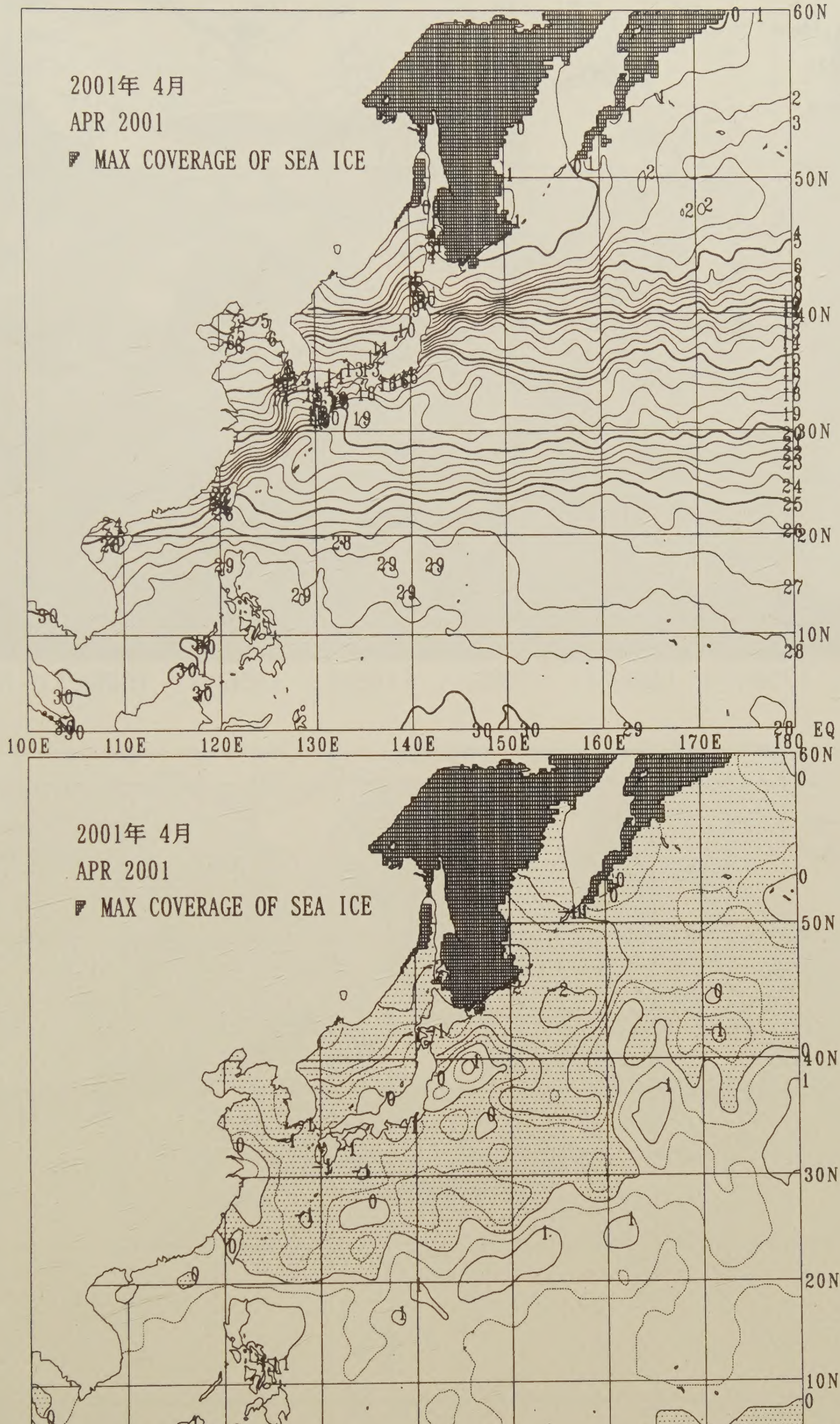


旬平均沿岸水温(℃)
Coastal Water Temperature

地点名 (Index Number)	水温 Temp.	偏差 Anom.
石　垣(47918)	24.4	-0.5
御前崎(47655)	16.1	-0.3
八丈島(47678)	18.9	-0.2
小名浜(47598)	12.7	1.1
宮　古(47585)	8.2	0.5
江　差(47428)	9.8	0.5
浜　田(47755)	16.0	0.5

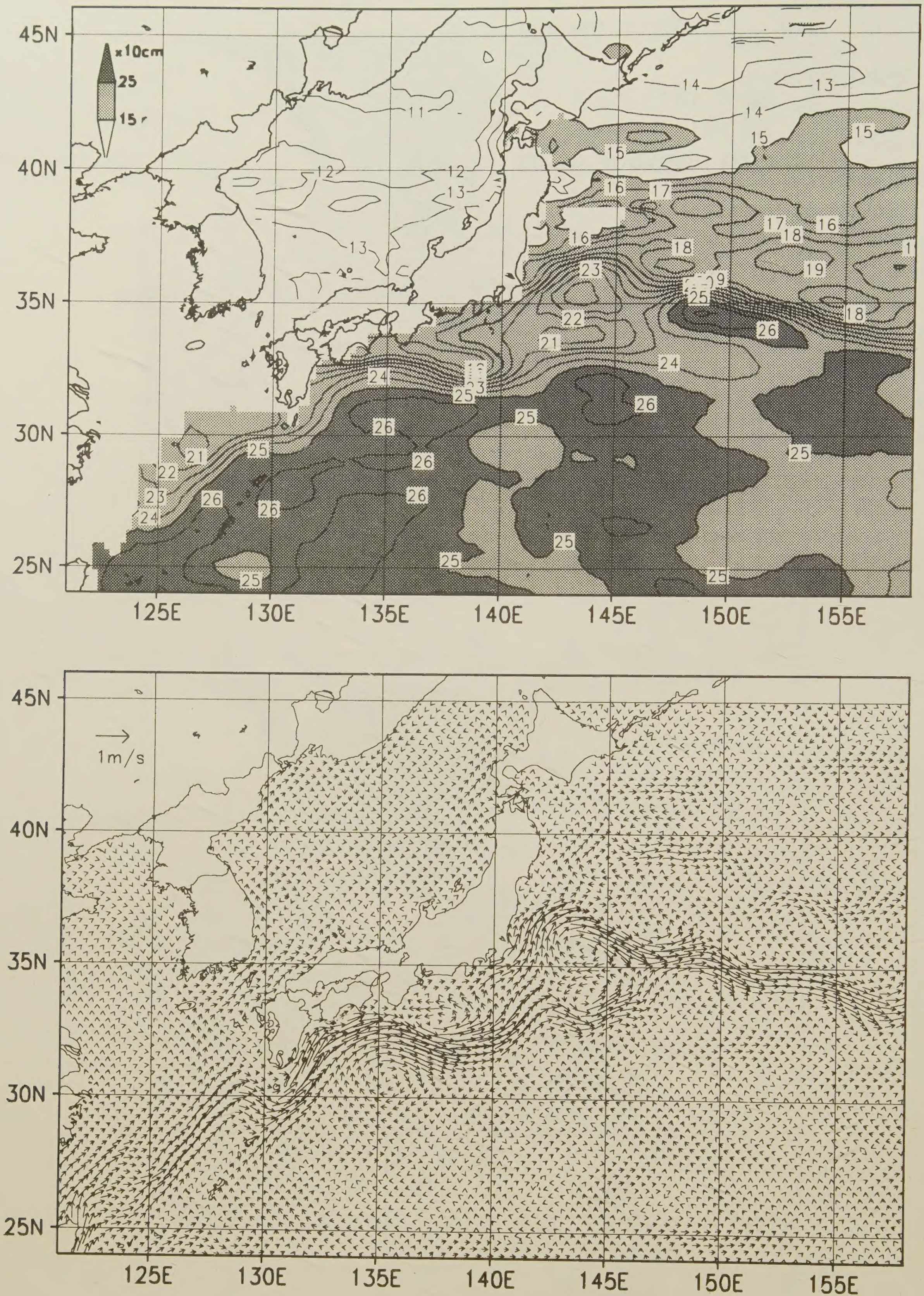
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Fig.3 Ten-day mean SST (top) and anomalies (bottom) in the western North Pacific for the 3rd ten-day period in APR 2001. Anomalies are computed from the JMA climatology (1971-2000). Contour interval is 1°C and additional anomaly contours of 0.5°C are shown by broken lines. Negative anomalies are spotted.



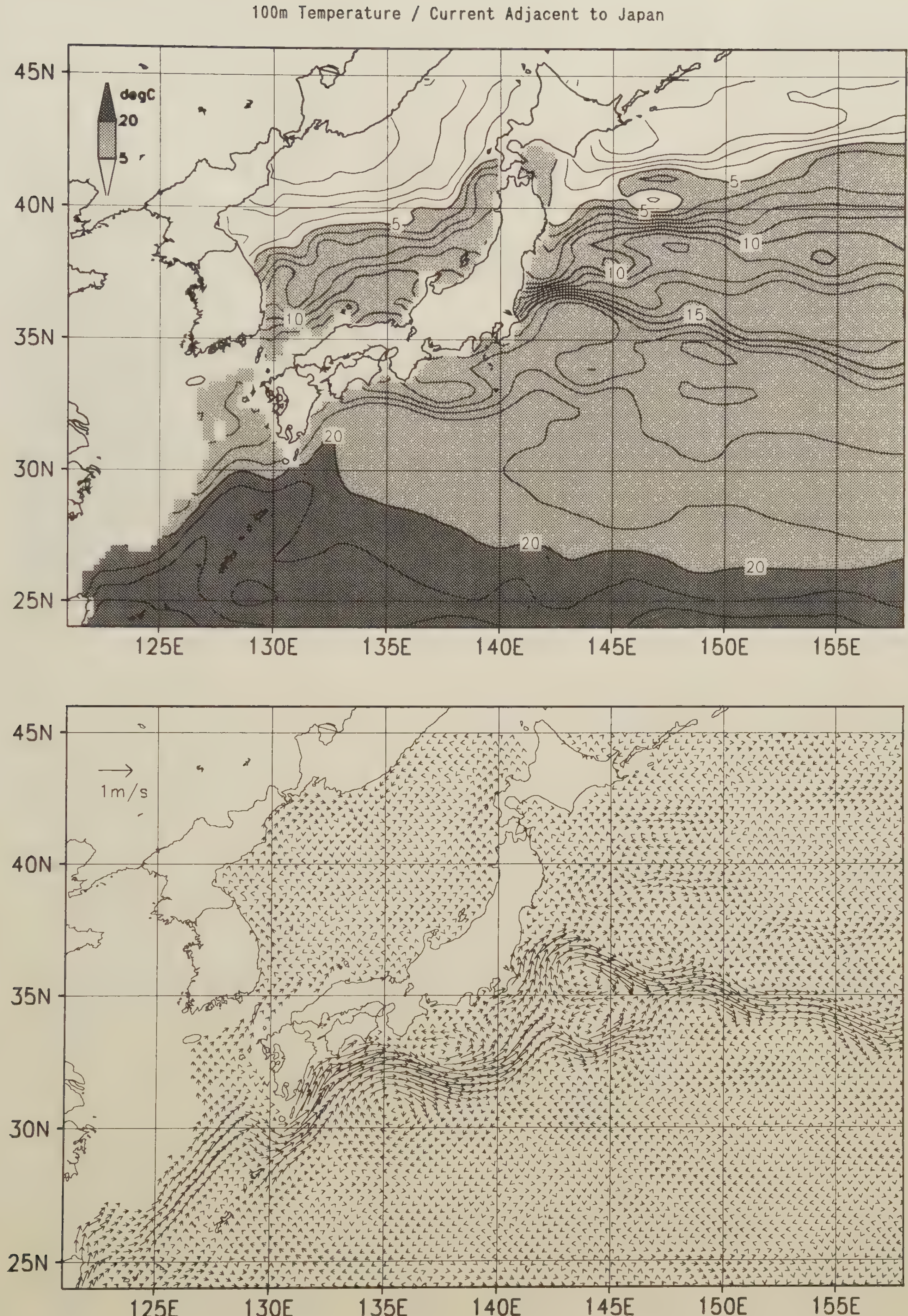
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Fig. 4 Monthly mean SST (top) and anomalies (bottom) in the western North Pacific for APR 2001. Anomalies are computed from the JMA climatology (1971-2000). Contour interval is 1°C and additional anomaly contours of 0.5°C are shown by broken lines. Negative anomalies are spotted.



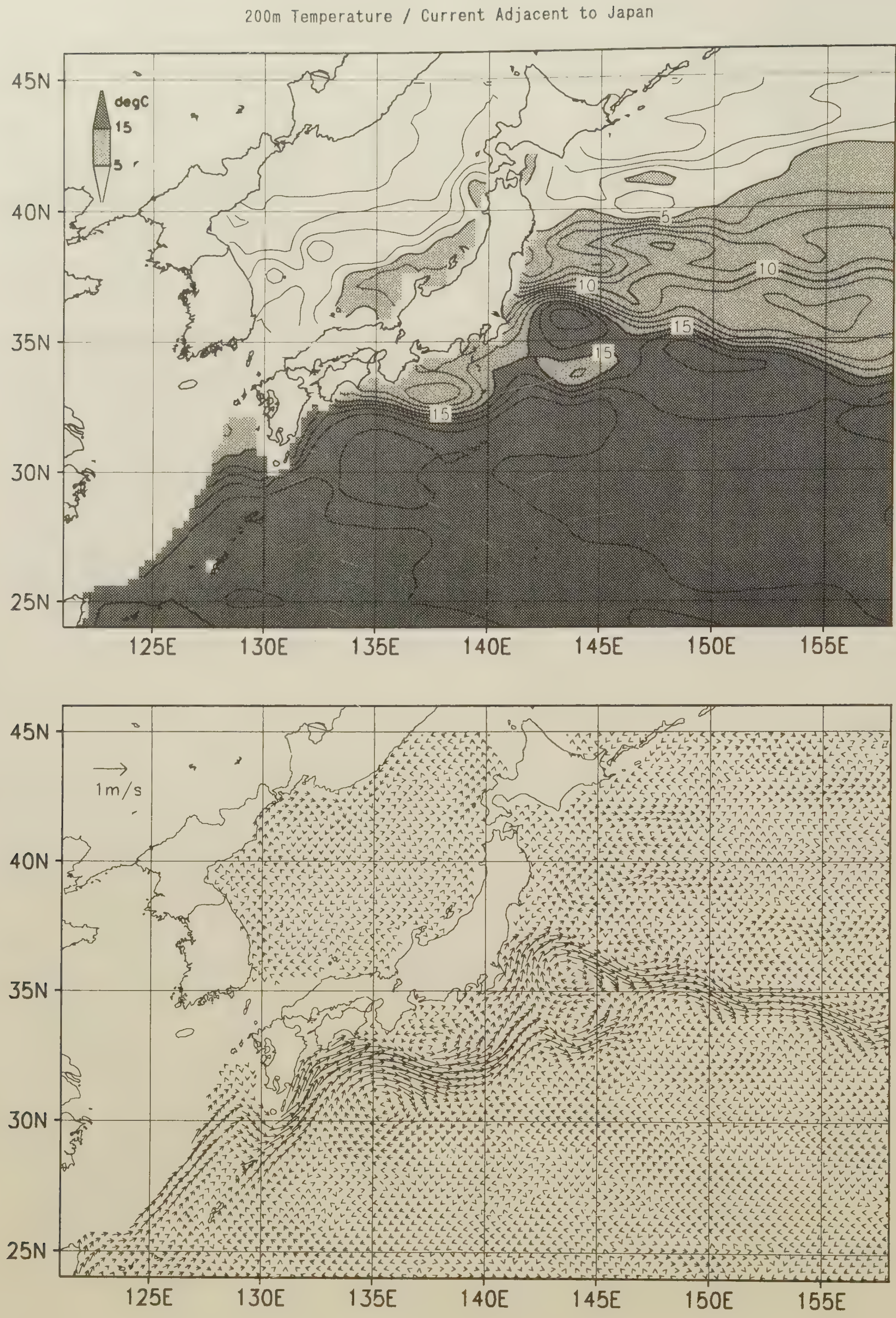
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Fig. 5　Monthly mean sea surface height (top) and current (bottom) in seas adjacent to Japan for April 2001. Contour interval is 10cm (top). (calculated by the Ocean Comprehensive Analysis System)



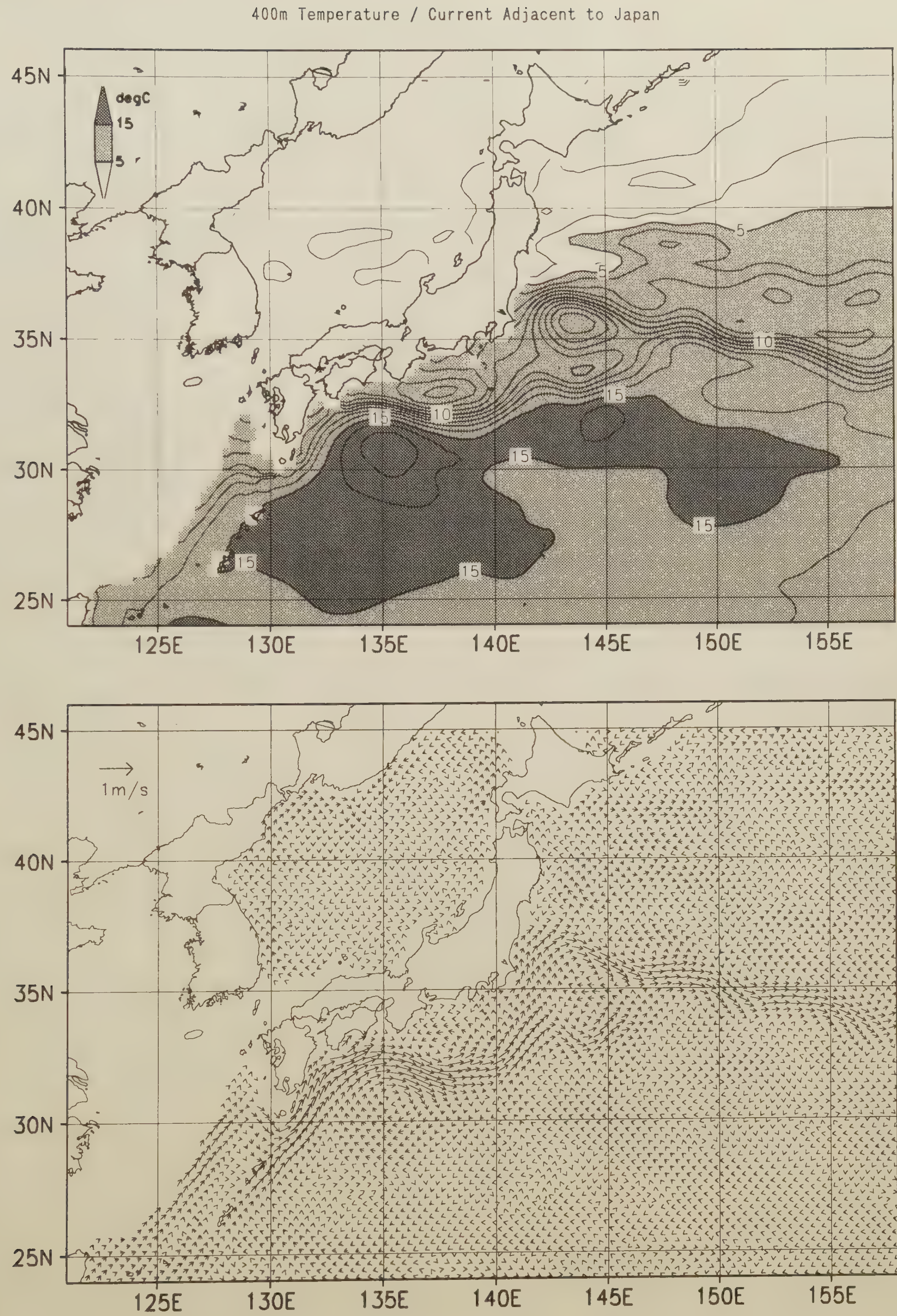
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（海洋総合解析システムによる）

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（海洋総合解析システムによる）

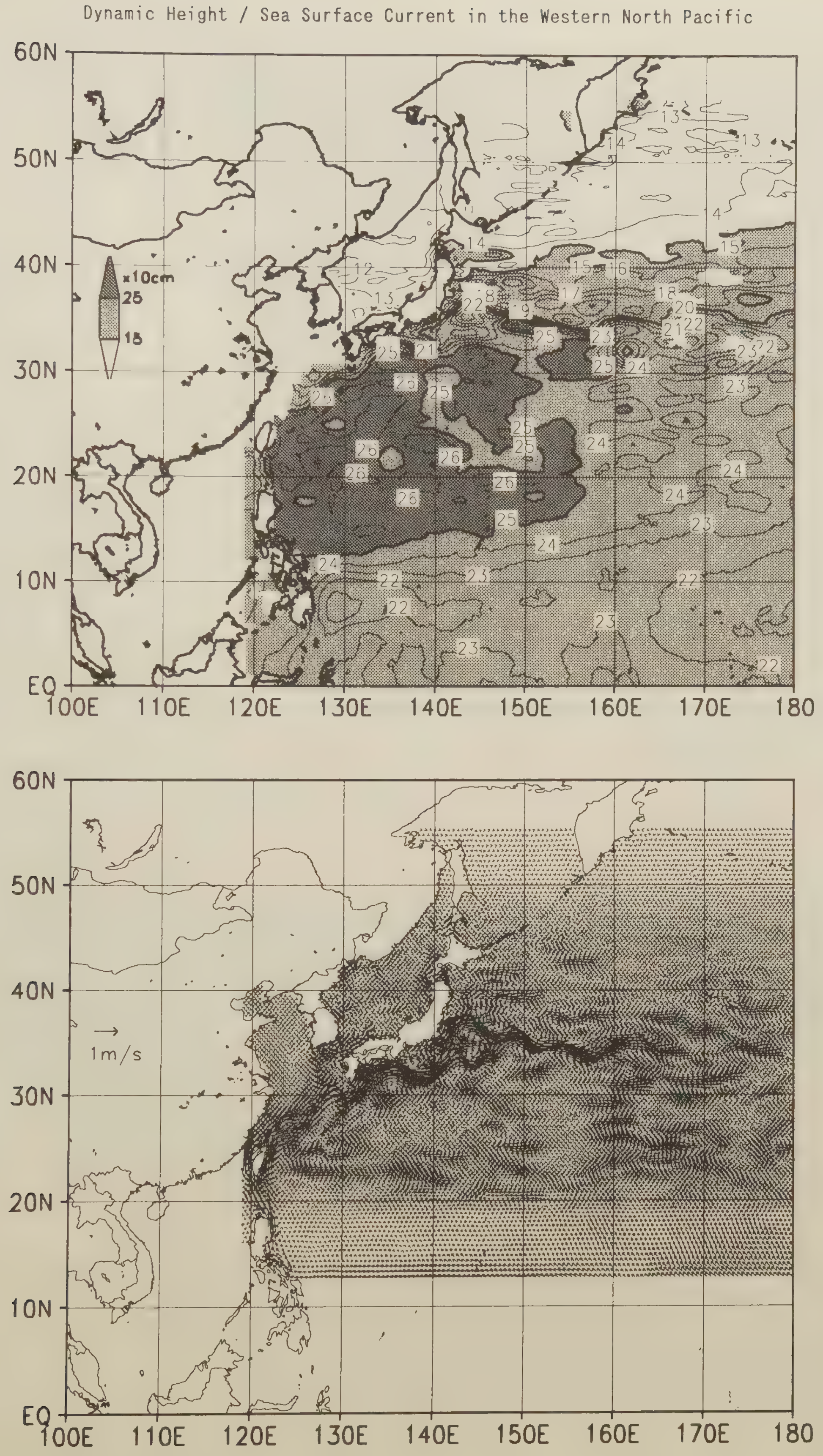
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Location of the Kuroshio axis



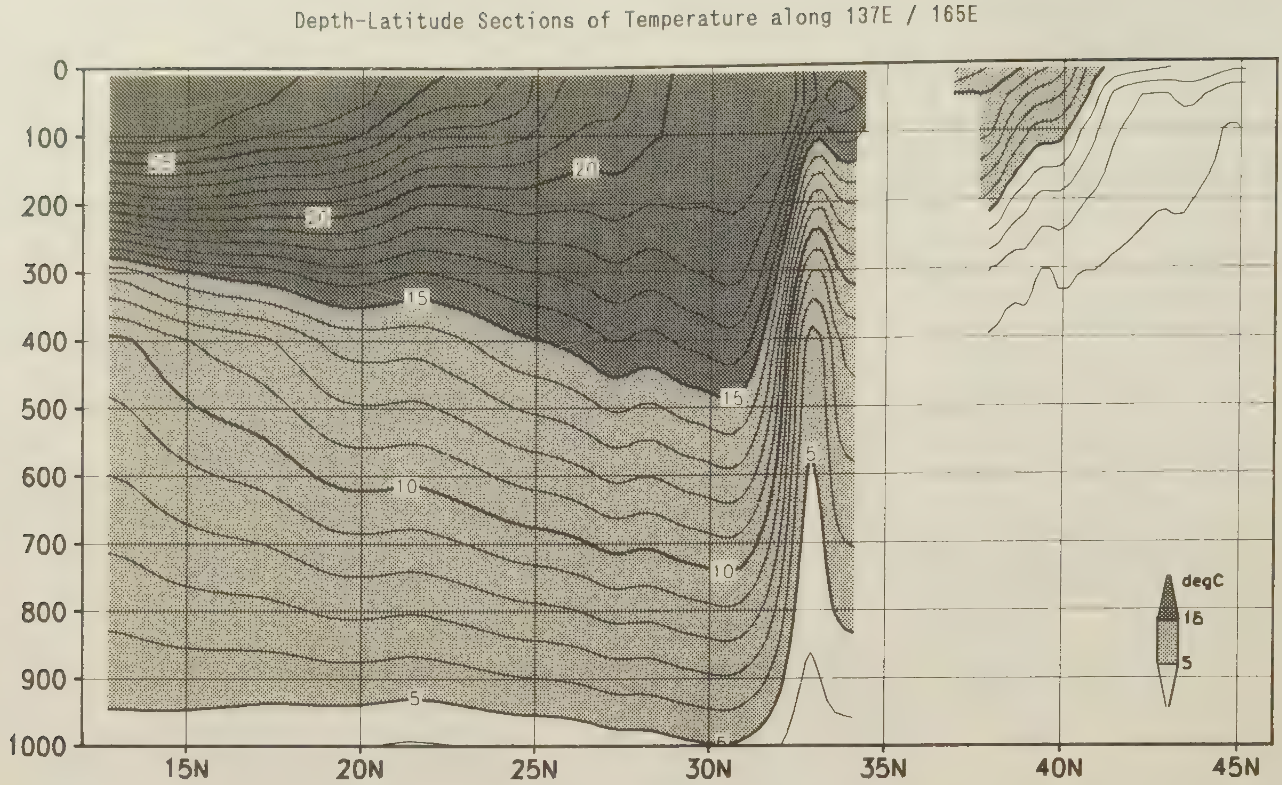
第9図 旬別黒潮流軸図

Fig. 9 Location of the Kuroshio axis



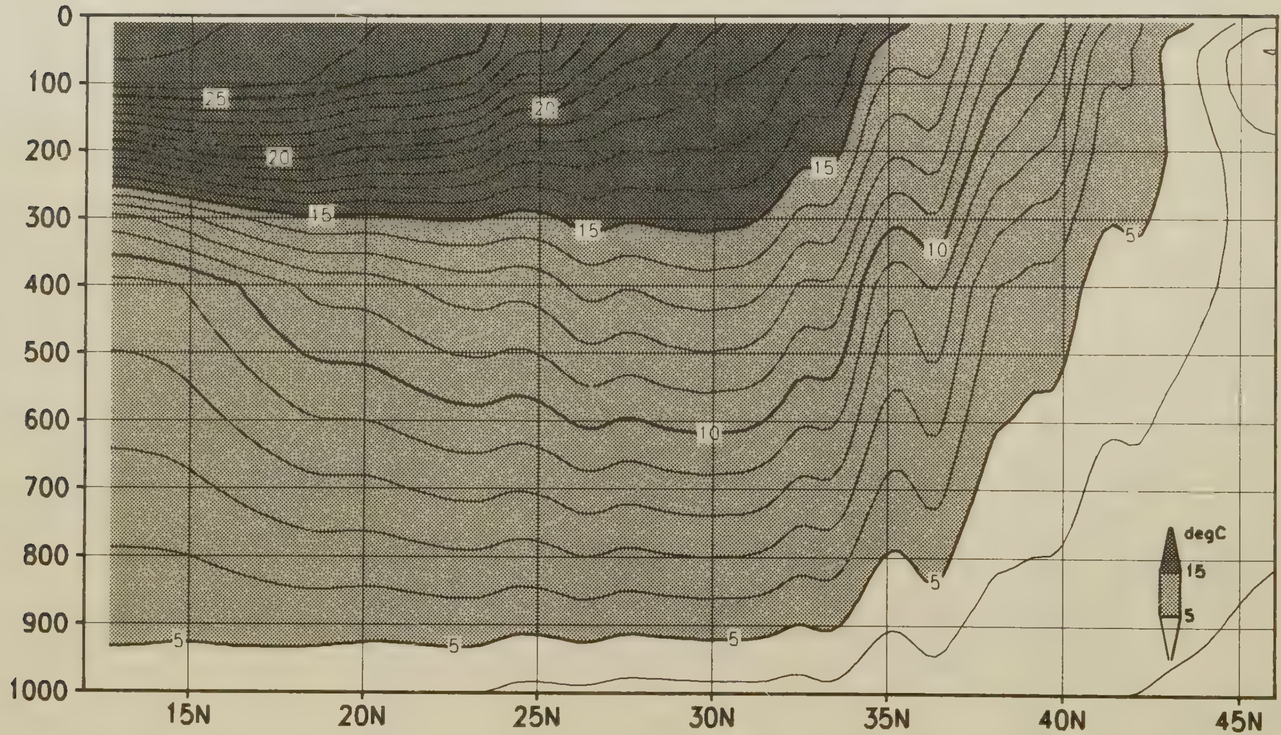
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Fig. 10　Monthly mean sea surface height (top) and current (bottom) in the western North Pacific for April 2001. Contour interval is 10cm (top). (calculated by the Ocean Comprehensive Analysis System)



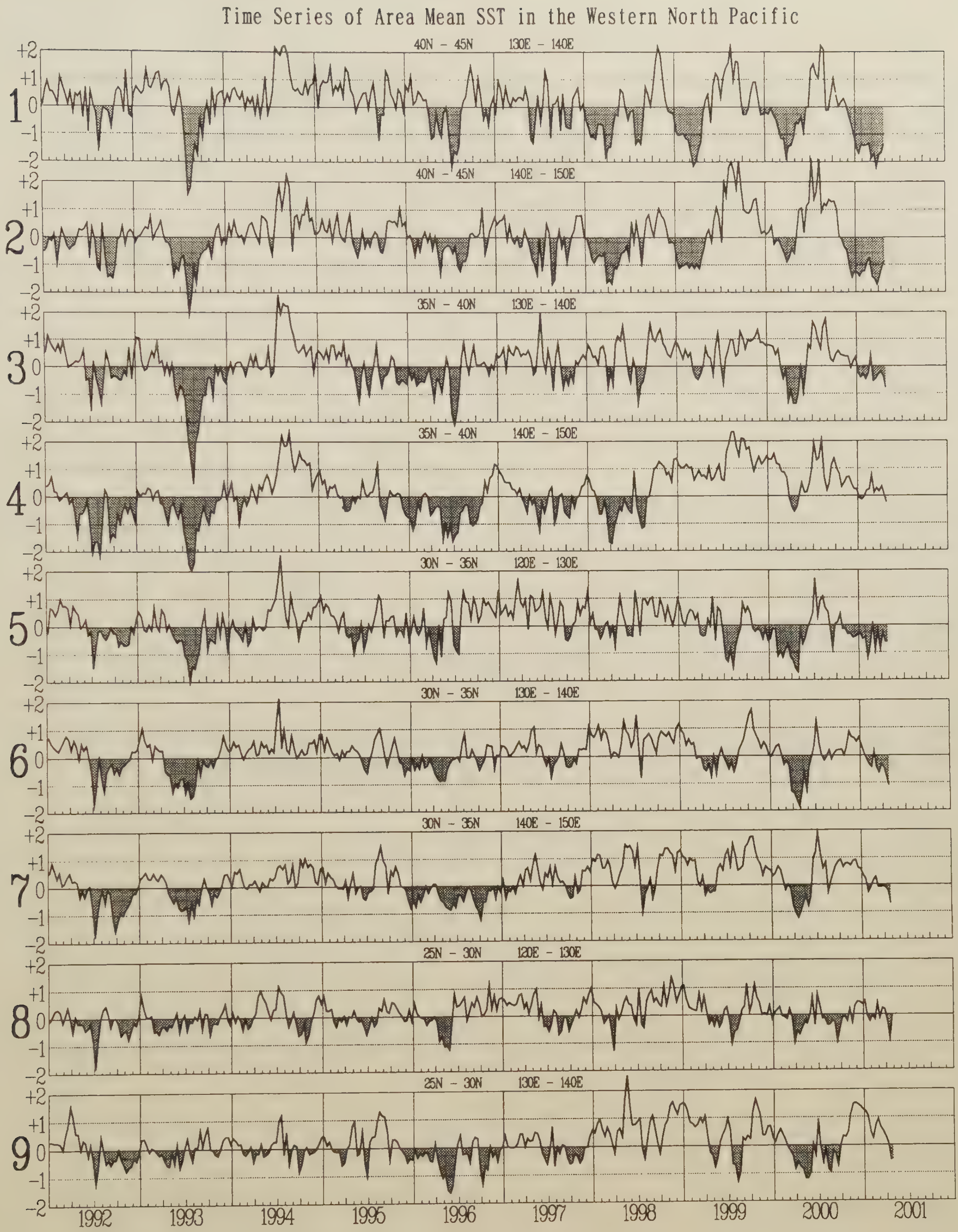
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(海洋総合解析システムによる)

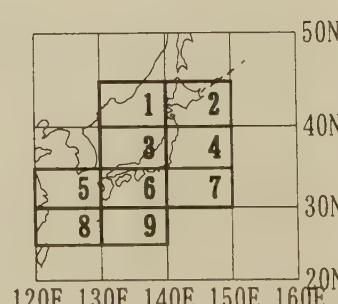
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(海洋総合解析システムによる)

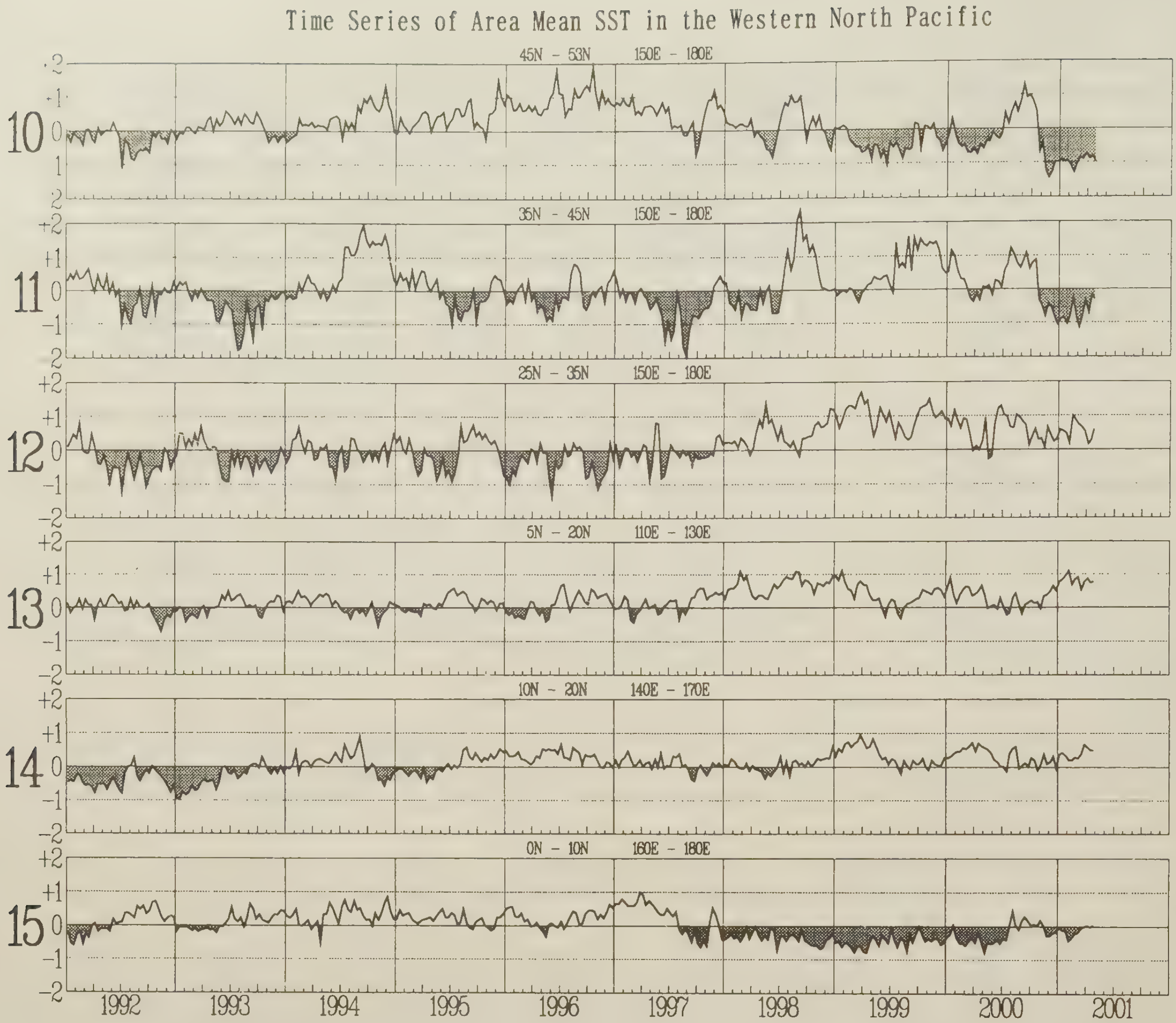
Fig. 12　Vertical cross section of monthly mean temperature along 165°E for April 2001. Contour interval is 1°C. (calculated by the Ocean Comprehensive Analysis System)





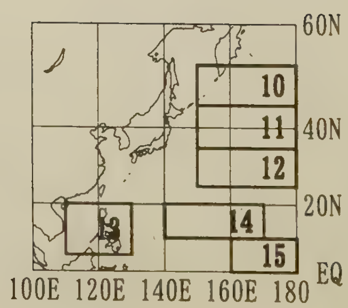
第13図 海域別旬平均海面水温平年偏差時系列図

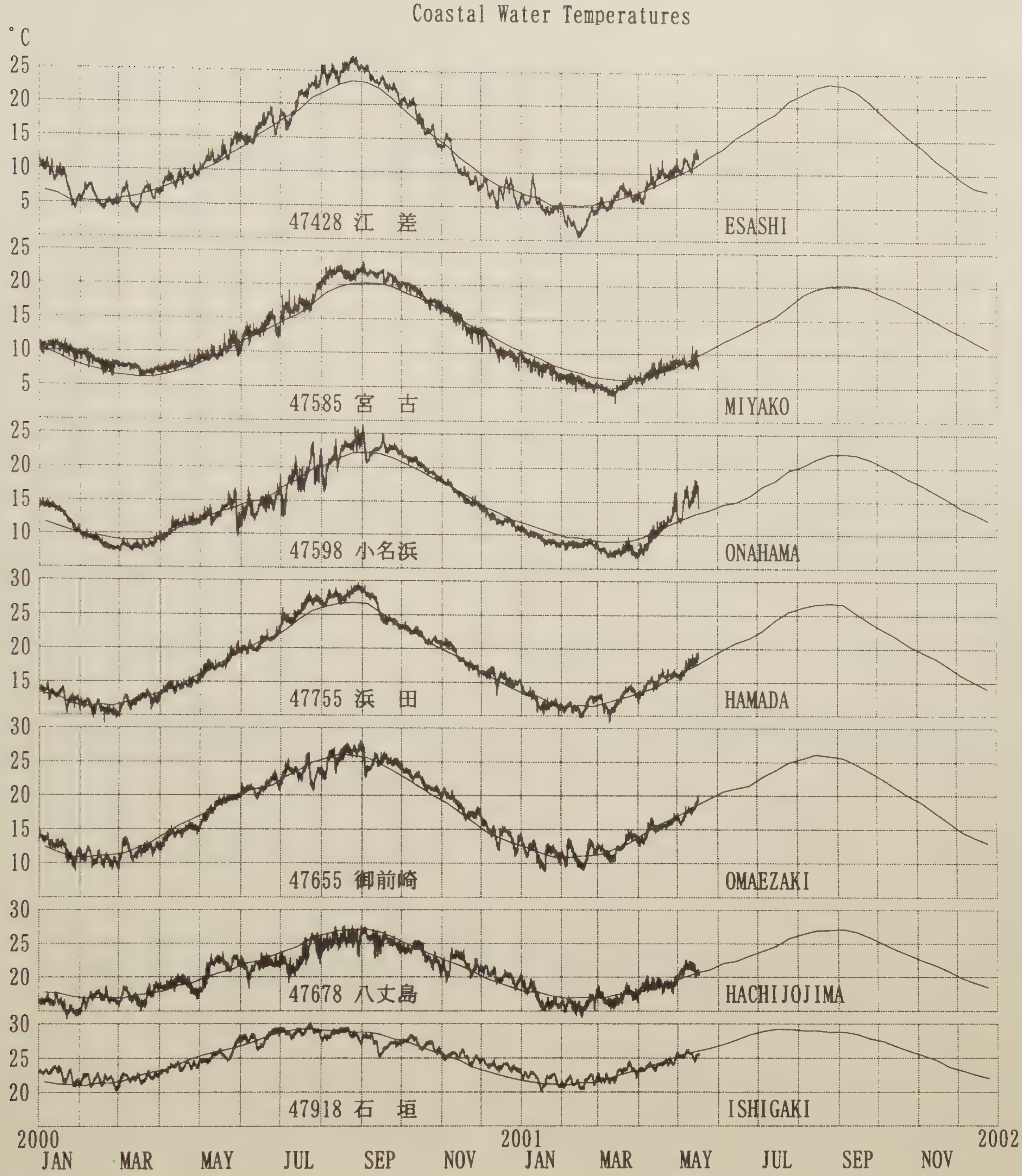
Fig. 13 Time series of the ten-day mean SST anomalies (℃) in the western North Pacific for the areas shown in the right panel. Negative anomalies are shaded. Anomalies are computed from the JMA climatology (1971-2000).

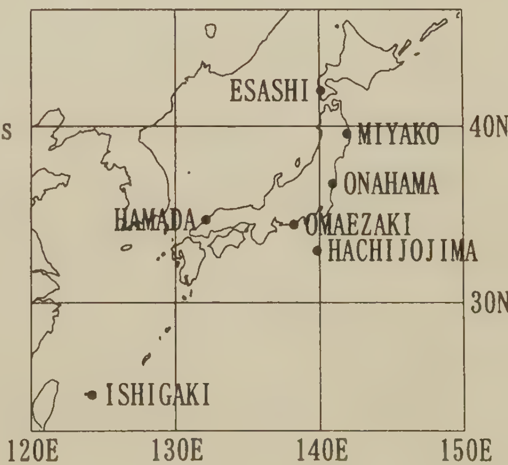


第13図　海域別旬平均海面水温平年偏差時系列図（つづき）

Fig. 13 (continue) Time series of the ten-day mean SST anomalies (°C) in the western North Pacific for the areas shown in the right panel. Negative anomalies are shaded. Anomalies are computed from the JMA climatology (1971-2000).

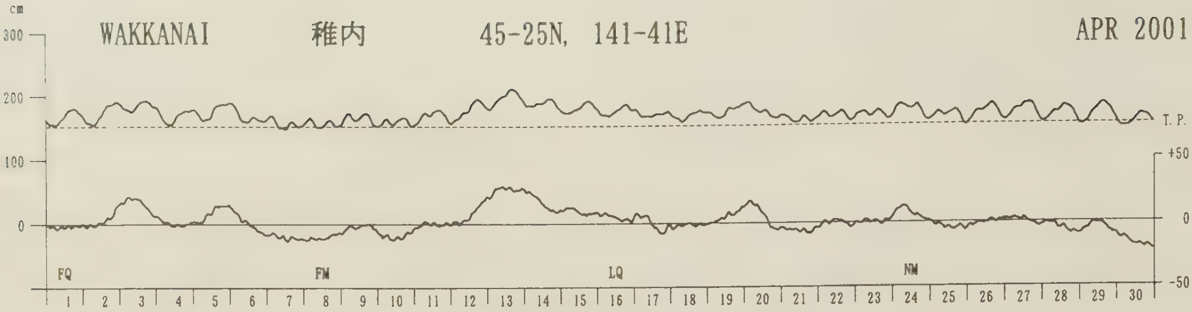


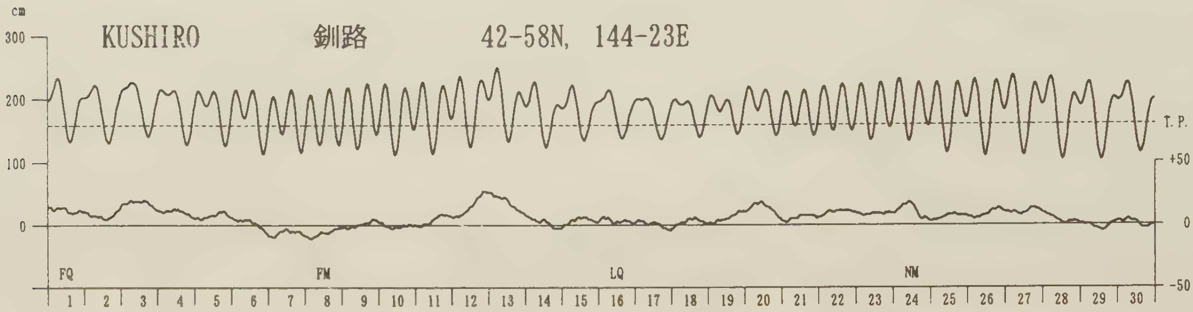


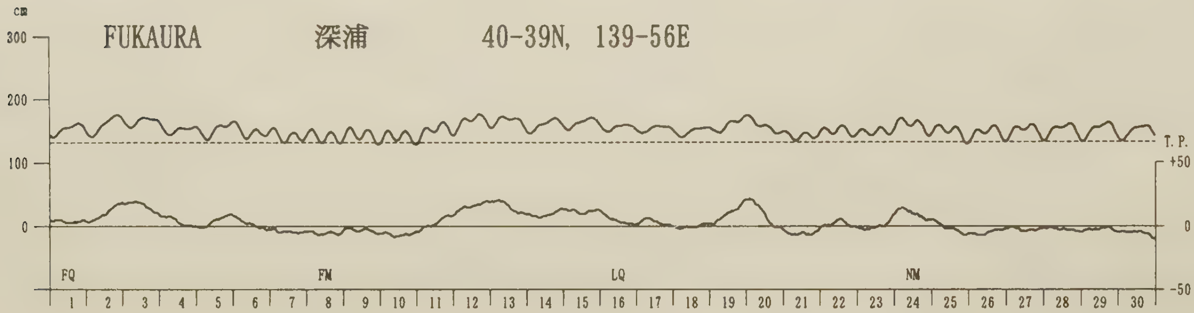


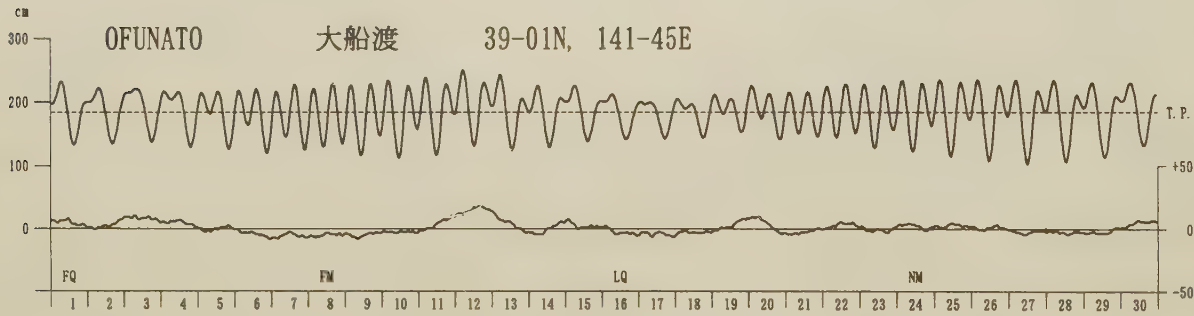
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Fig. 14 Time series of hourly coastal water temperatures (°C) measured at 7 coastal stations of the JMA shown in the right panel.
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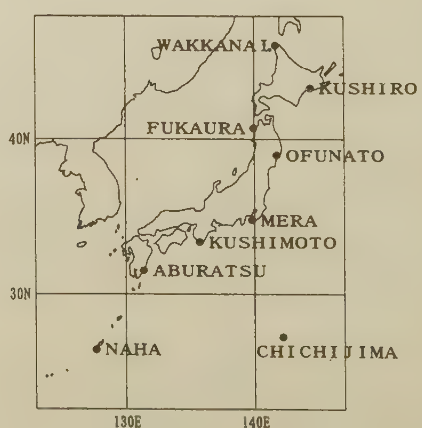


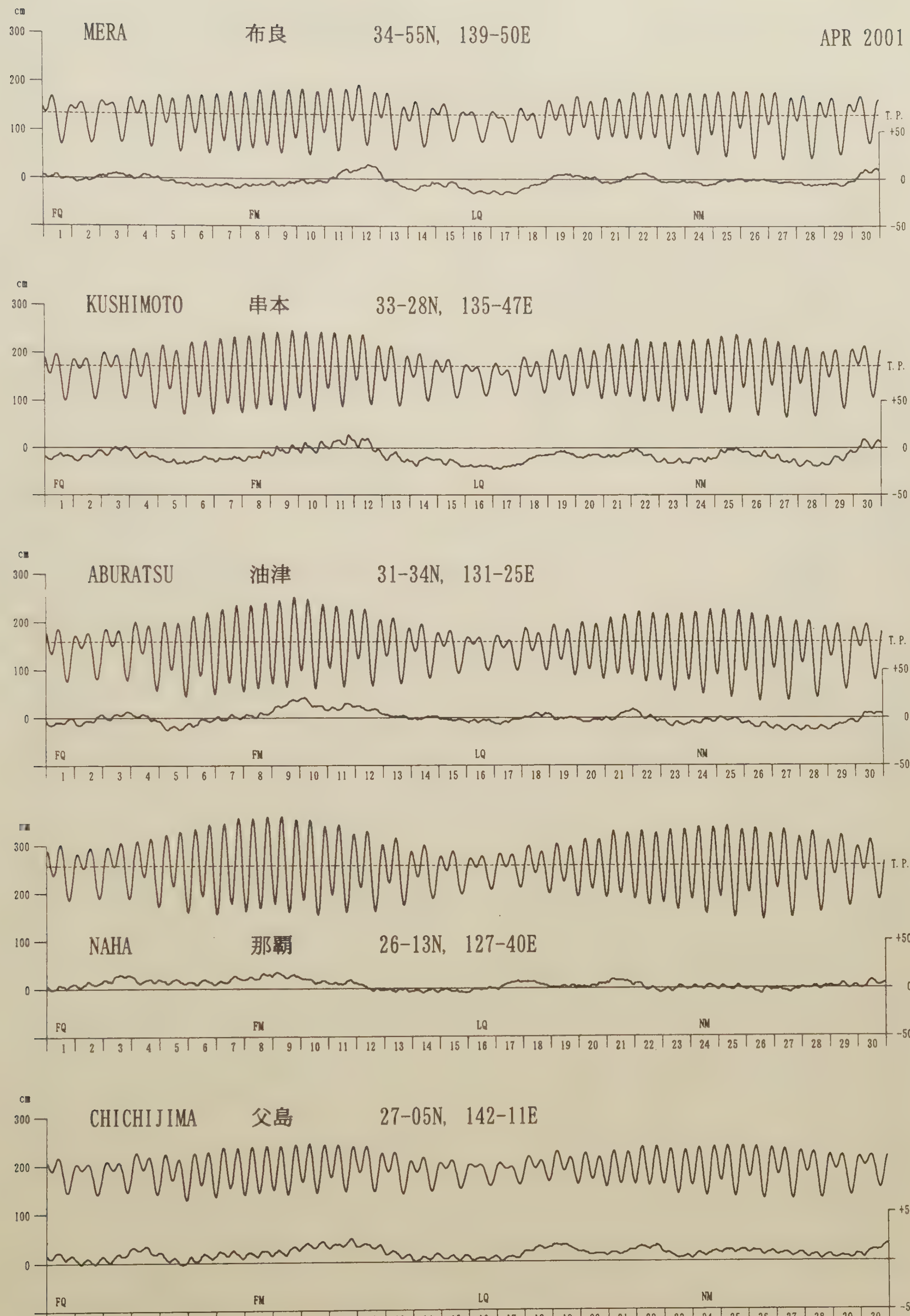


第15図 沿岸潮位時系列図（2001年 4月）

Fig. 14 Time series of hourly sea level observation (upper line) and its anomalies (lower line) at 9 stations of the JMA in the right panel.
Short term variations are removed from raw data.

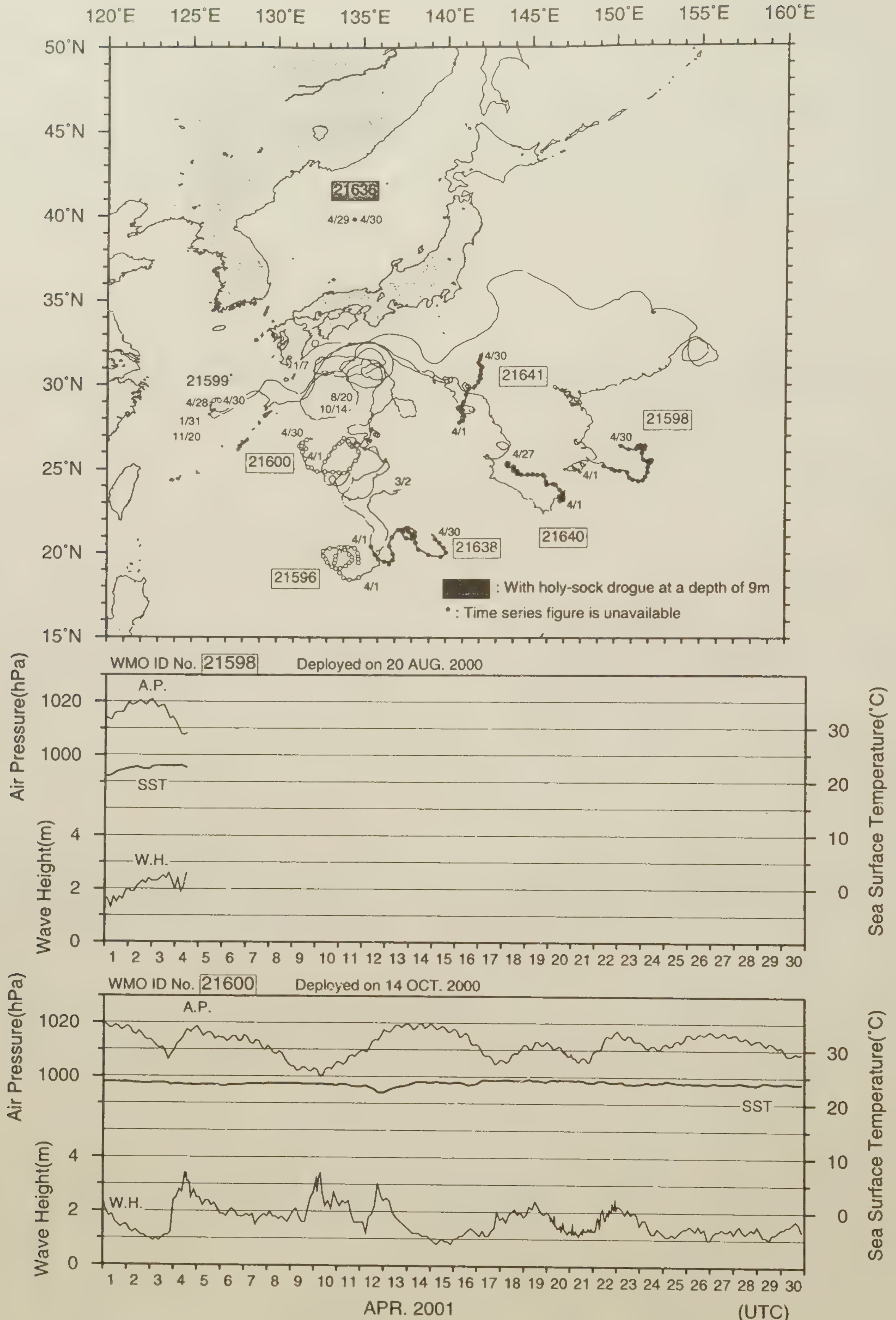
NM: new moon, FQ: first quarter
FM: full moon, LQ: last quarter
T. P. : Mean sea level of Tokyo Bay (Tokyo Peil)





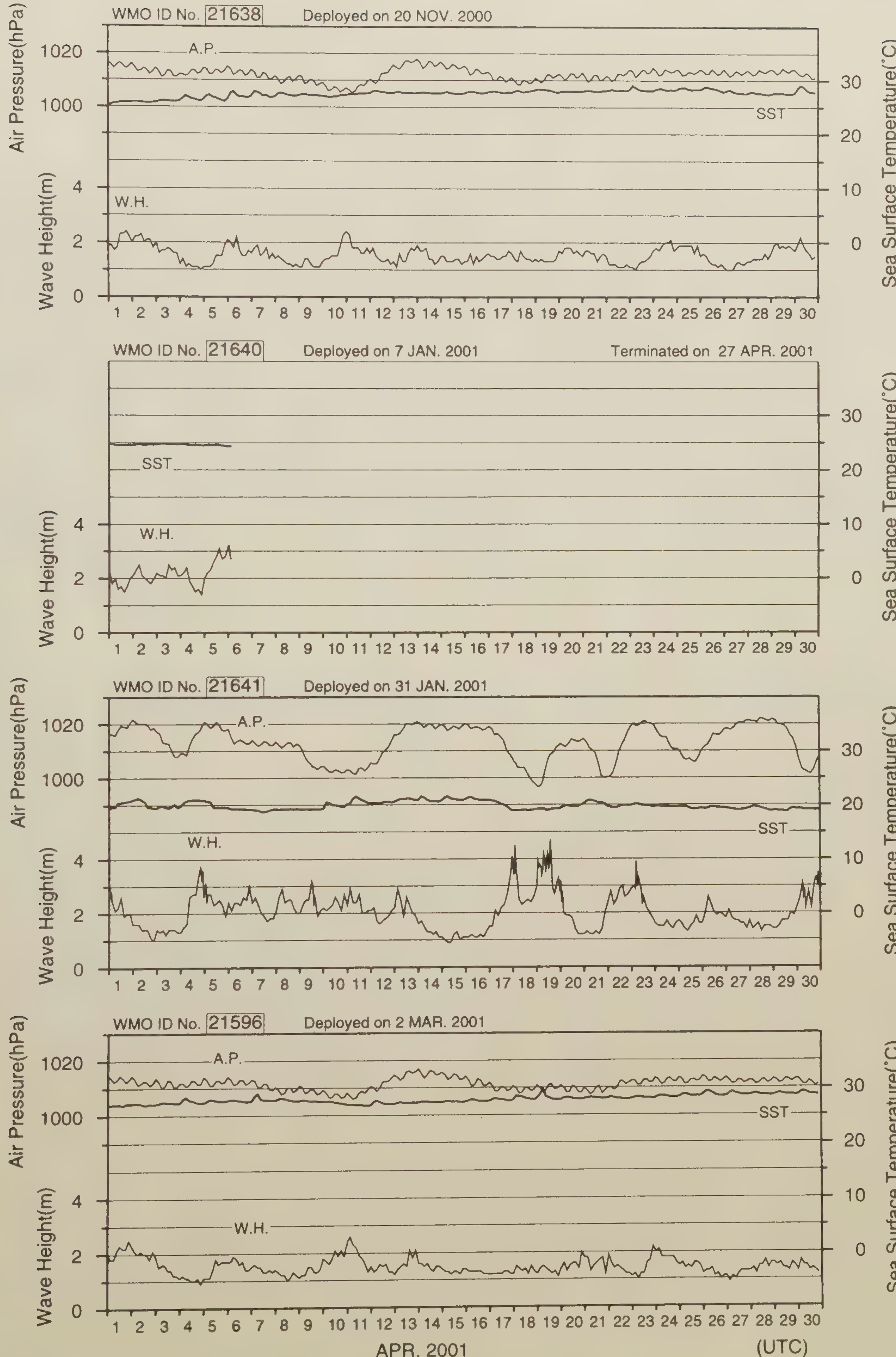
第15図 つづき

Fig. 15 continue



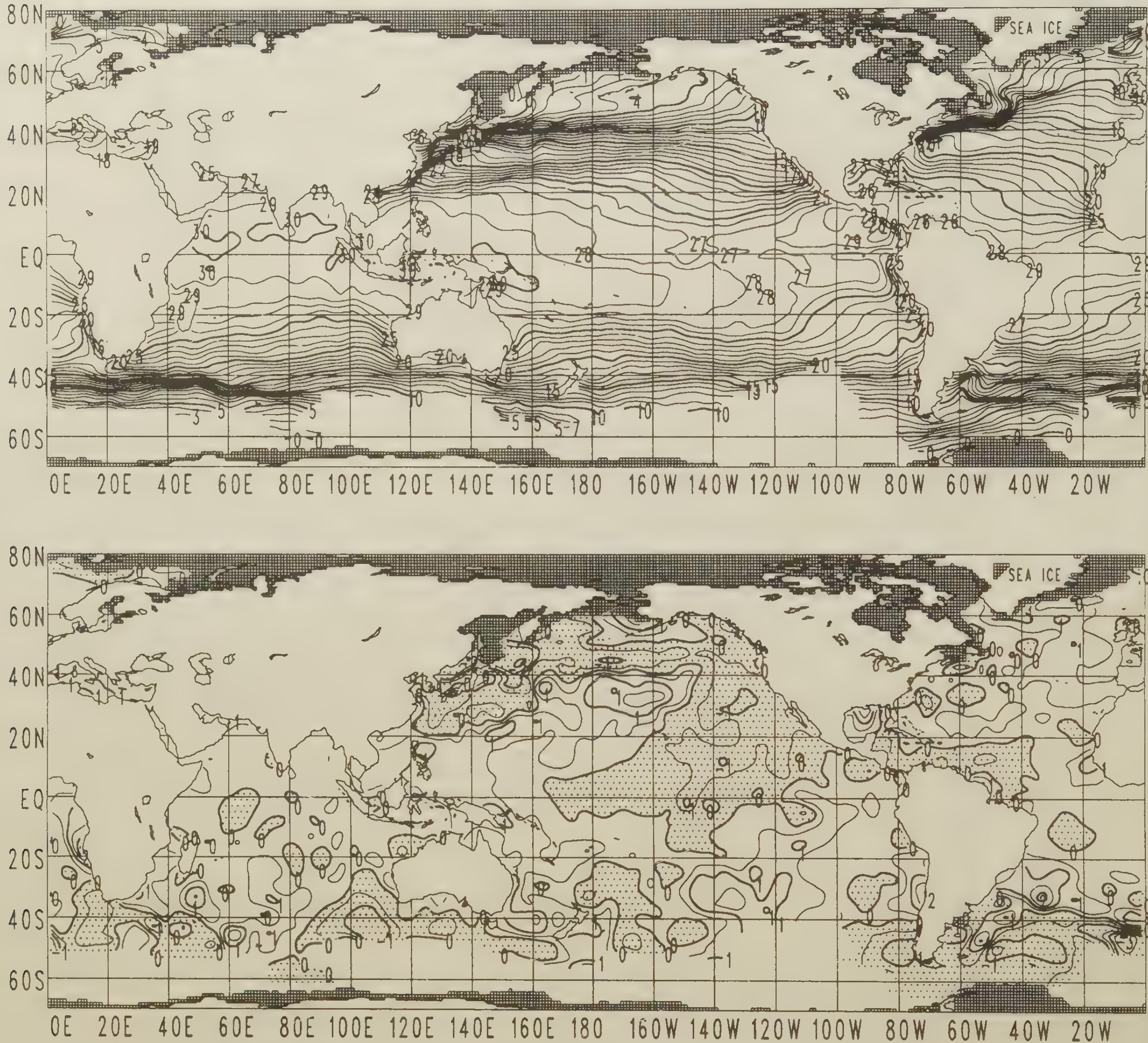
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Fig.16　Time series of JMA drifting buoy observation.
The upper panel shows paths of the buoys. Circles denote the position at 00h UTC everyday.
The lower panel shows time series of observation data.



第16図 つづき
Fig.16 continue

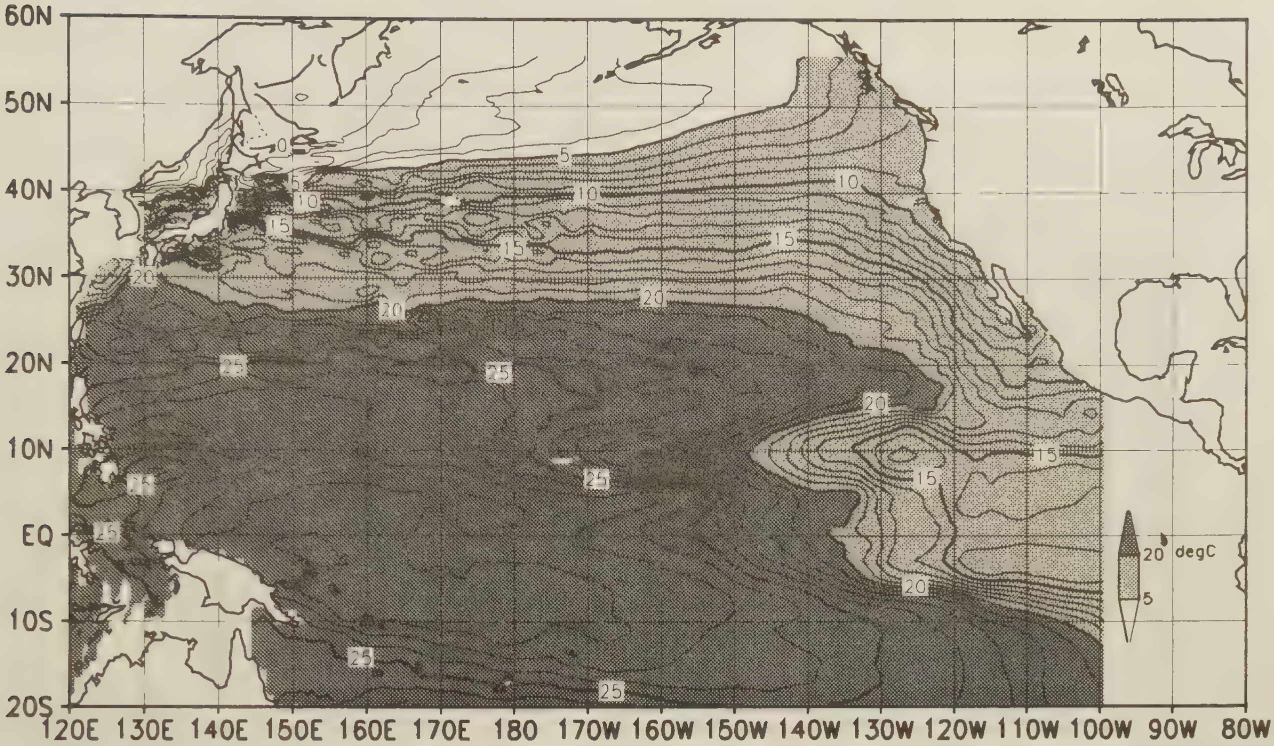
SST & Anomalies in the Global Ocean



第17図　全球月平均海面水温図（上）及び偏差図（下）（2001年 4月）

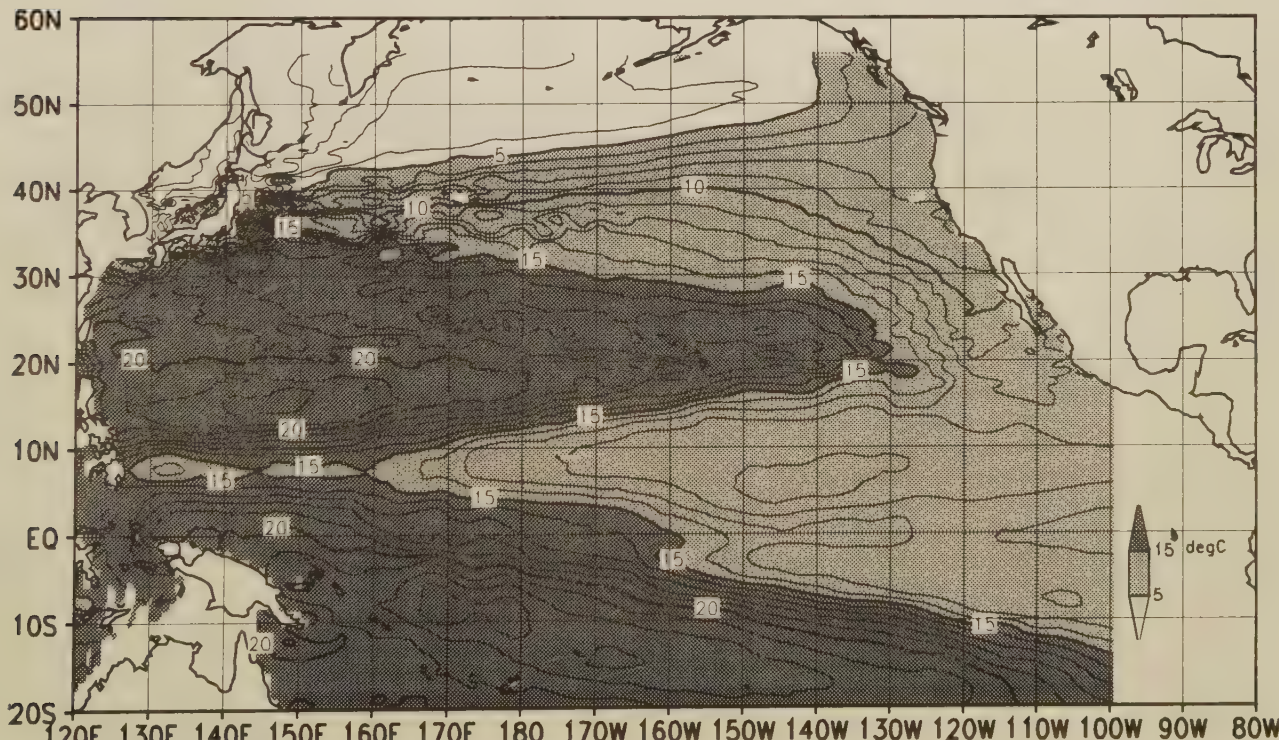
Fig. 17 Monthly mean SST over the global ocean (top) and anomalies (bottom) for APR 2001. Anomalies are computed from the JMA climatology (1971-2000). Contour interval is 1°C (top) and additional anomaly contours of ±0.5°C are shown by thin lines. Negative anomalies are spotted. Maximum coverage of sea ice is shaded. Data sources for sea ice are U.S. National Ice Center (polar regions) and JMA (the Sea of Okhotsk).

100m / 200m Temperature in the Pacific Ocean



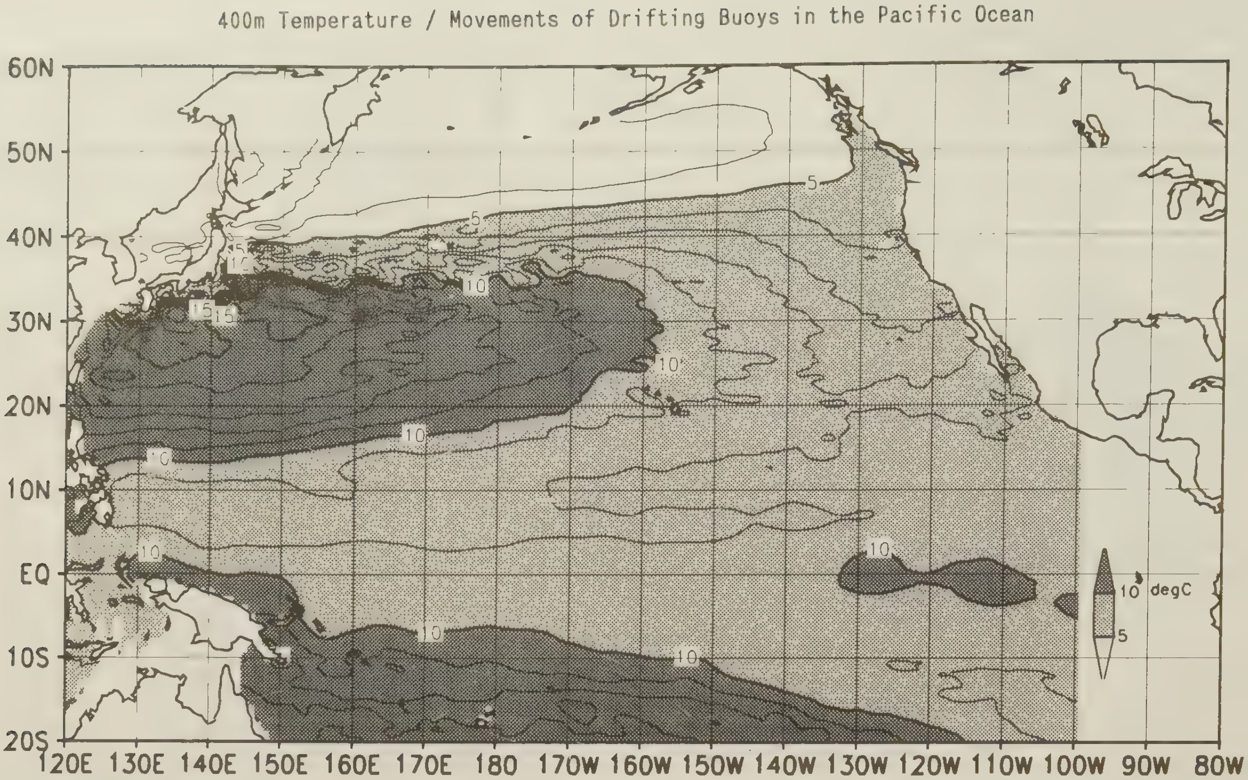
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（海洋総合解析システムによる）

Fig. 18　Monthly mean subsurface (100 m) temperature in the Pacific Ocean for April 2001. Contour interval is 1 ℃. (calculated by the Ocean Comprehensive Analysis System)



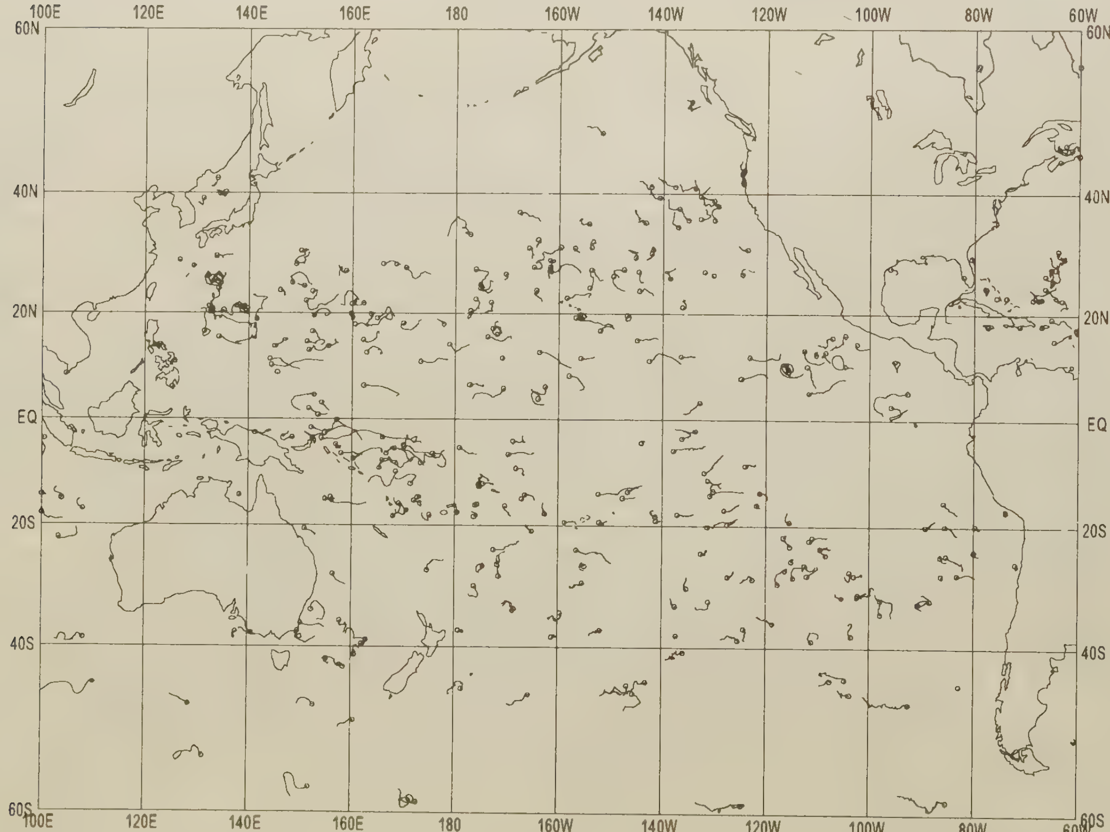
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（海洋総合解析システムによる）

Fig. 19　Monthly mean subsurface (200 m) temperature in the Pacific Ocean for April 2001. Contour interval is 1 ℃. (calculated by the Ocean Comprehensive Analysis System)



第 20 図　太平洋月平均表層水温図（深さ 400 m）（2001 年 4 月）
（海洋総合解析システムによる）

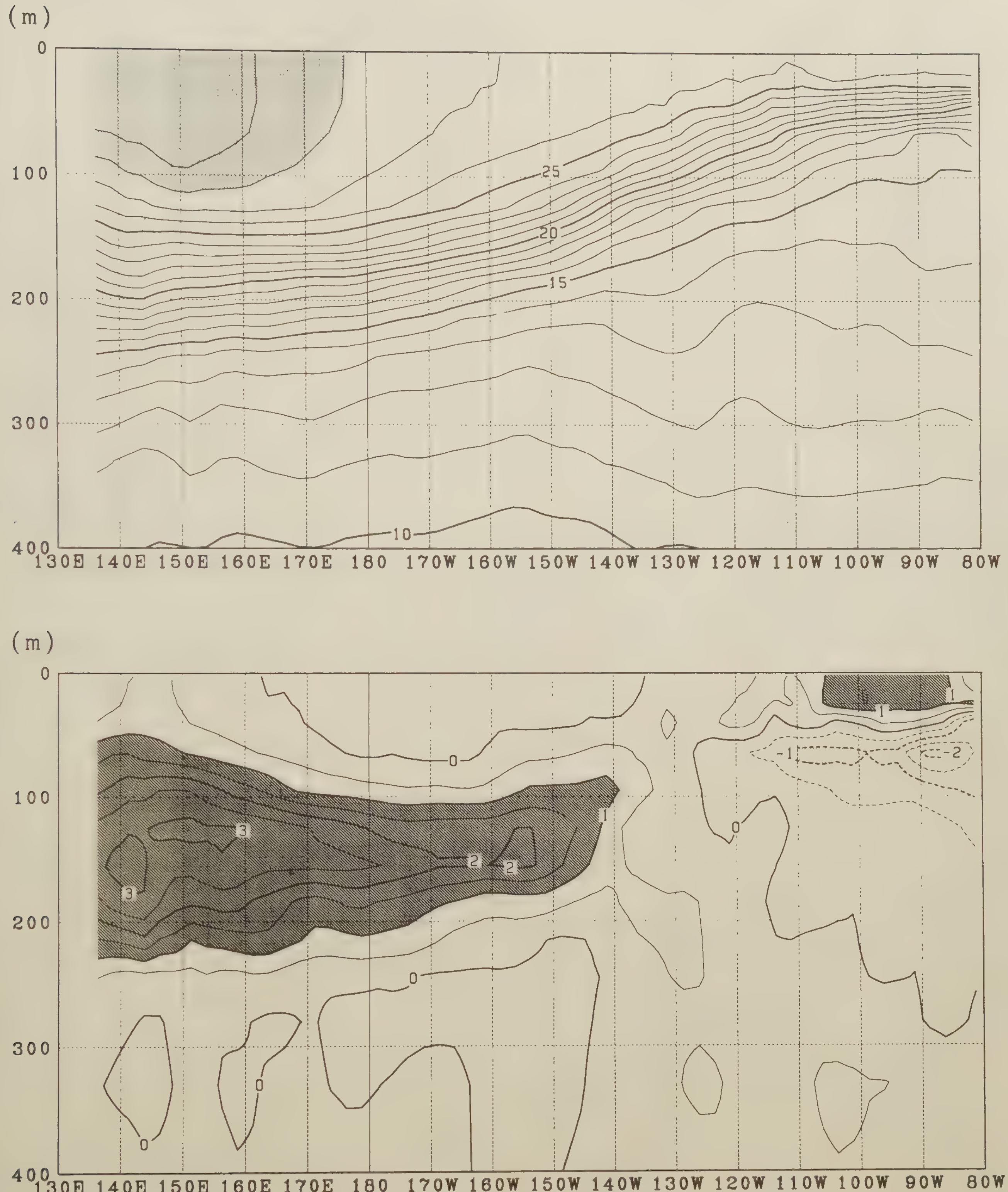
Fig. 20　Monthly mean subsurface (400 m) temperature in the Pacific Ocean for April 2001. Contour interval is 1 °C. (calculated by the Ocean Comprehensive Analysis System)



第 21 図　太平洋ブイ流跡図（2001 年 4 月）

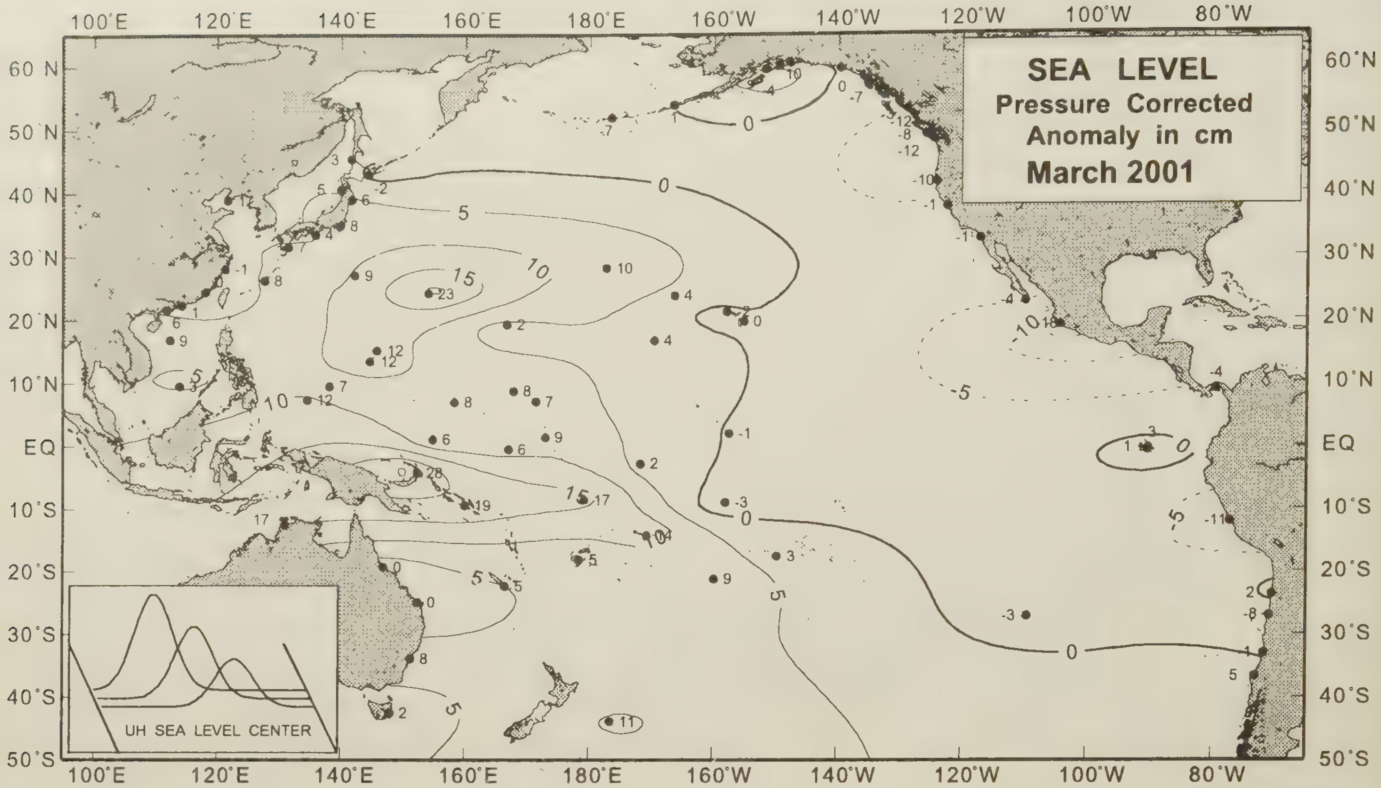
Fig. 21　Trajectories of drifting buoys in the Pacific Ocean during April 2001. Each track is for one buoy. Small circles represent the last positions for the month.

Depth-Longitude Sections of Equatorial Temperature & Anomalies



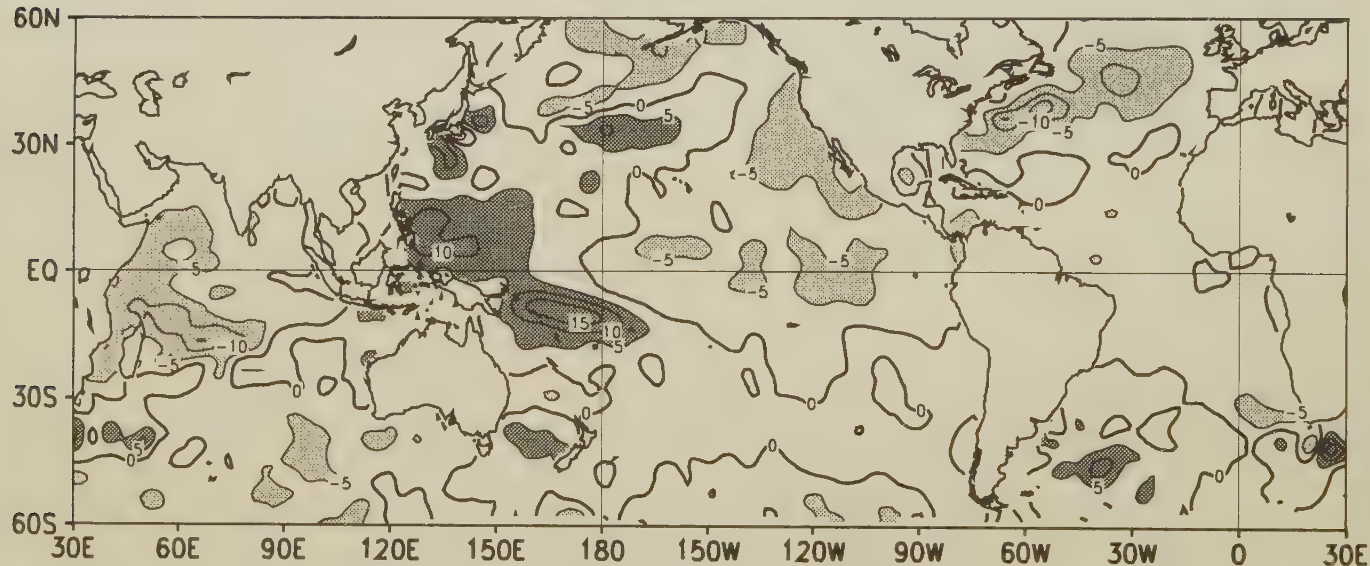
第22図　太平洋赤道に沿う表層水温（上）及び偏差（下）の深度－経度断面図（2001年 4月）

Fig. 22 Depth-longitude sections of temperature (top) and anomalies (bottom) along the equator in the Pacific Ocean for APR 2001. Data are derived from the Ocean Data Assimilation System of JMA. Contour interval is 1°C (top) and 0.5°C (bottom). Values greater than 28°C in the top panel are shaded. In the bottom panel, values greater than 1°C are shaded and values less than -1°C are spotted. Anomalies are computed from 1987-1999 base period means.



第 23 図　太平洋月平均海面水位偏差図 (2001 年 3 月)

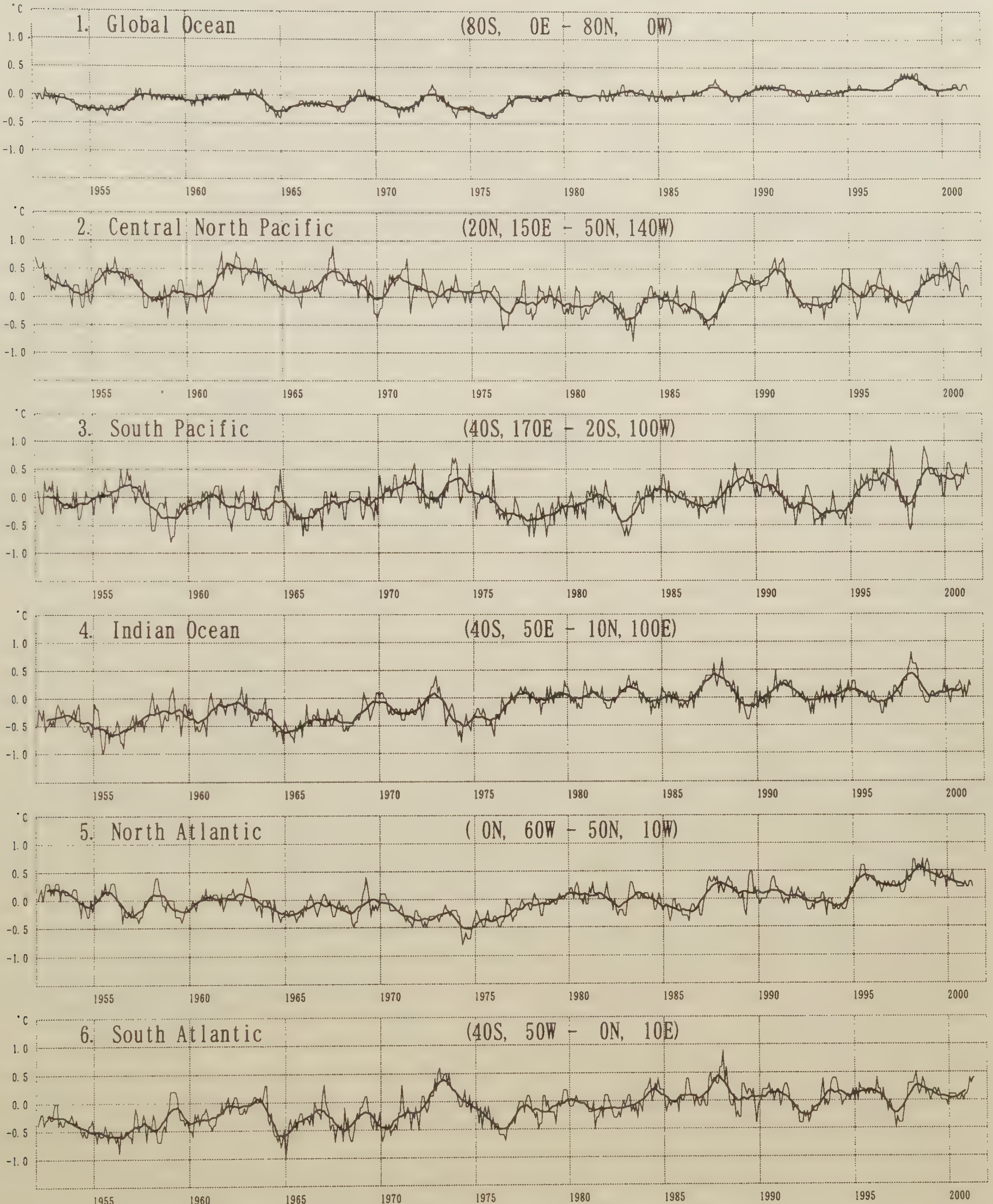
Fig. 23　Monthly sea level anomalies for March 2001 obtained from mean sea level (1975-1995) adjusted for atmospheric pressure. This figure is prepared by the SOC of ISLP-PAC, Department of Oceanography, University of Hawaii.



第 24 図　全球月平均海面高度偏差図 (2001 年 3 月)

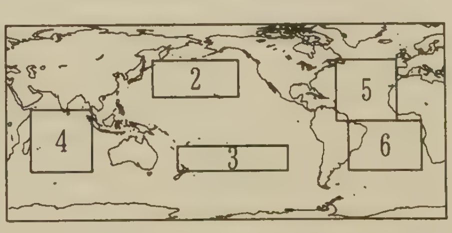
Fig. 24　Monthly sea surface height anomalies in the global ocean derived from the altimeter data of TOPEX/POSEIDON for March 2001. Contour interval is 5 cm. Positive anomalies exceeding +5 cm are shaded and negative anomalies exceeding -5 cm are spotted. Anomalies are computed from 1993-1998 base period means.

Long-term Variation of Monthly Mean SST Anomalies

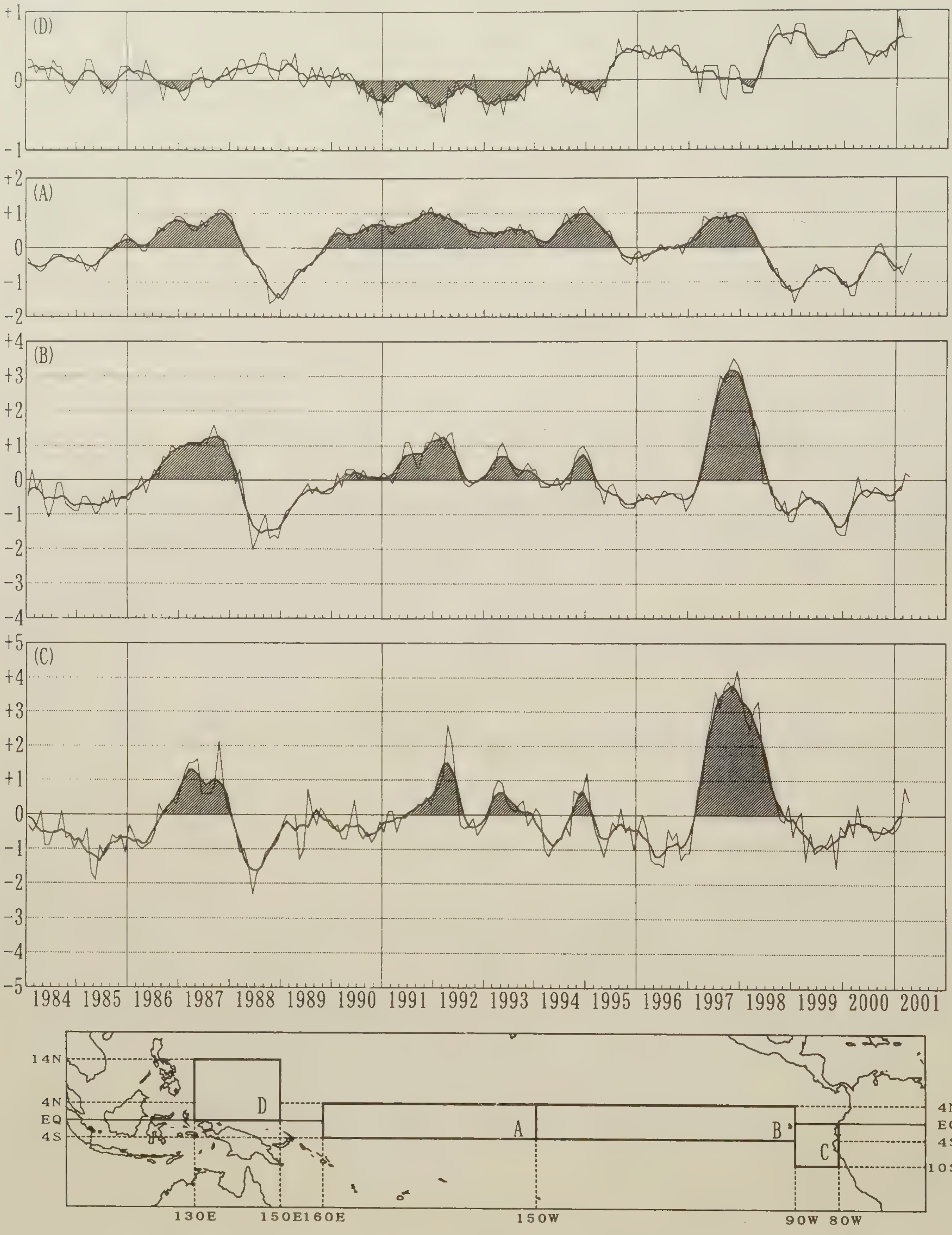


第24図 海域平均海面水温偏差の長期変動

Fig. 24 Long-term variations of monthly mean sea surface temperature anomalies (°C) for the areas shown in the right panel. Anomalies are computed from the JMA climatology (1971-2000). Thin lines show the monthly mean and thick lines their 13-month running means.



Time Series of Tropical Pacific SST Anomalies



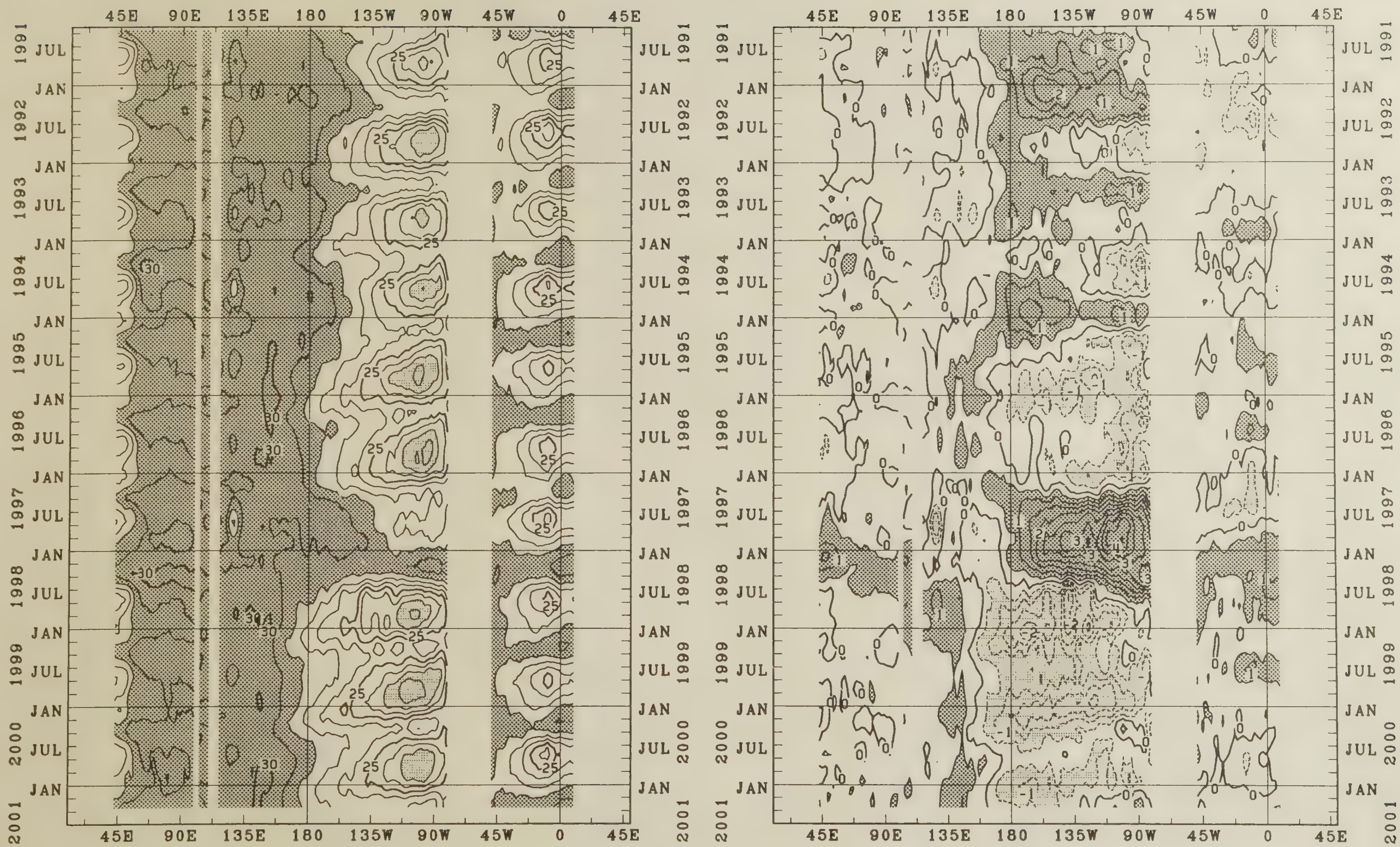
第26図　太平洋熱帯域の海面水温偏差時系列図

Fig. 26 Time series of monthly mean SST anomalies (°C) in the tropical Pacific Ocean for the areas indicated at the bottom panel. Thin lines show the monthly means and thick lines their 5-month running means. Positive anomalies (A, B, C) and negative anomalies (D) are shaded. Anomalies are computed from the JMA climatology (1971-2000).

	SEA SURFACE TEMPERATURE AND ANOMALY (°C)								SOI	SEA LEVEL PRESSURE ANOMALY (hPa)	
MONTH YEAR	REGION D 14N-EQ 130E-150E		REGION A 4N-4S 160E-150W		REGION B 4N-4S 150W-90W		REGION C EQ-10S 90W-80W		SOI	TAHITI 17-33S 149-37W	DARWIN 12-24S 130-52E
JAN 99	29.3	0.8	26.4	-1.6	24.2	-1.2	23.9	-0.6	1.5	2.2	-1.2
FEB 99	29.1	0.8	26.7	-1.3	25.5	-0.8	25.9	-0.1	0.8	1.8	-0.2
MAR 99	29.3	0.8	27.0	-1.1	26.8	-0.3	26.4	0.1	0.9	0.9	-1.2
APR 99	29.3	0.5	27.3	-0.9	26.7	-0.5	24.1	-1.3	1.6	2.0	-0.5
MAY 99	29.7	0.4	27.8	-0.8	26.4	-0.5	23.8	-0.5	0.2	1.5	1.2
JUN 99	29.7	0.3	28.0	-0.5	25.5	-0.7	21.8	-1.1	0.3	1.2	0.7
JUL 99	29.6	0.3	27.8	-0.7	24.8	-0.6	20.9	-1.0	0.4	1.3	0.6
AUG 99	29.5	0.3	27.8	-0.6	24.0	-0.7	20.0	-0.9	0.4	1.8	1.2
SEP 99	29.7	0.4	27.8	-0.6	23.8	-0.9	19.7	-0.8	0.0	0.6	0.6
OCT 99	29.8	0.4	27.8	-0.6	23.6	-1.1	20.4	-0.5	1.1	1.7	-0.0
NOV 99	29.7	0.4	27.5	-0.9	23.2	-1.5	20.3	-1.5	1.2	1.6	-0.4
DEC 99	29.4	0.4	27.1	-1.1	23.4	-1.6	22.6	-0.3	1.6	2.6	-0.3
JAN 00	29.2	0.7	27.0	-1.0	23.8	-1.6	24.0	-0.5	0.5	1.7	0.6
FEB 00	29.0	0.7	26.6	-1.4	25.3	-1.0	25.9	-0.1	1.2	3.1	0.2
MAR 00	29.1	0.6	26.7	-1.4	26.6	-0.5	25.7	-0.6	1.1	2.1	-0.2
APR 00	29.3	0.5	27.4	-0.8	27.3	0.1	25.7	0.3	1.4	1.5	-0.6
MAY 00	29.7	0.4	27.9	-0.7	26.5	-0.4	24.0	-0.3	0.3	1.2	0.8
JUN 00	29.6	0.2	28.1	-0.4	25.7	-0.5	22.6	-0.3	-0.4	0.8	1.2
JUL 00	29.6	0.3	28.2	-0.3	25.0	-0.4	21.6	-0.3	-0.3	-0.1	0.5
AUG 00	29.6	0.4	28.4	0.0	24.5	-0.2	20.2	-0.7	0.7	0.7	-0.5
SEP 00	29.7	0.4	28.5	0.1	24.4	-0.3	19.9	-0.6	1.0	2.0	0.2
OCT 00	29.7	0.3	28.2	-0.2	24.3	-0.4	20.6	-0.3	1.0	0.7	-1.0
NOV 00	29.8	0.5	27.9	-0.5	24.1	-0.6	21.4	-0.4	1.9	1.6	-1.9
DEC 00	29.4	0.4	27.5	-0.7	24.4	-0.6	22.4	-0.5	0.9	-0.3	-2.1
JAN 01	29.4	0.9	27.4	-0.6	25.1	-0.3	24.1	-0.4	0.8	3.0	1.1
FEB 01	28.9	0.6	27.2	-0.8	26.0	-0.3	25.8	-0.2	1.0	-0.0	-2.7
MAR 01	29.1	0.6	27.6	-0.5	27.3	0.2	27.1	0.8	0.8	1.8	0.2
APR 01	29.4	0.6	28.0	-0.2	27.3	0.1	25.8	0.4	0.2	0.4	0.2

第1表　太平洋熱帯域の大気及び海洋の監視指数

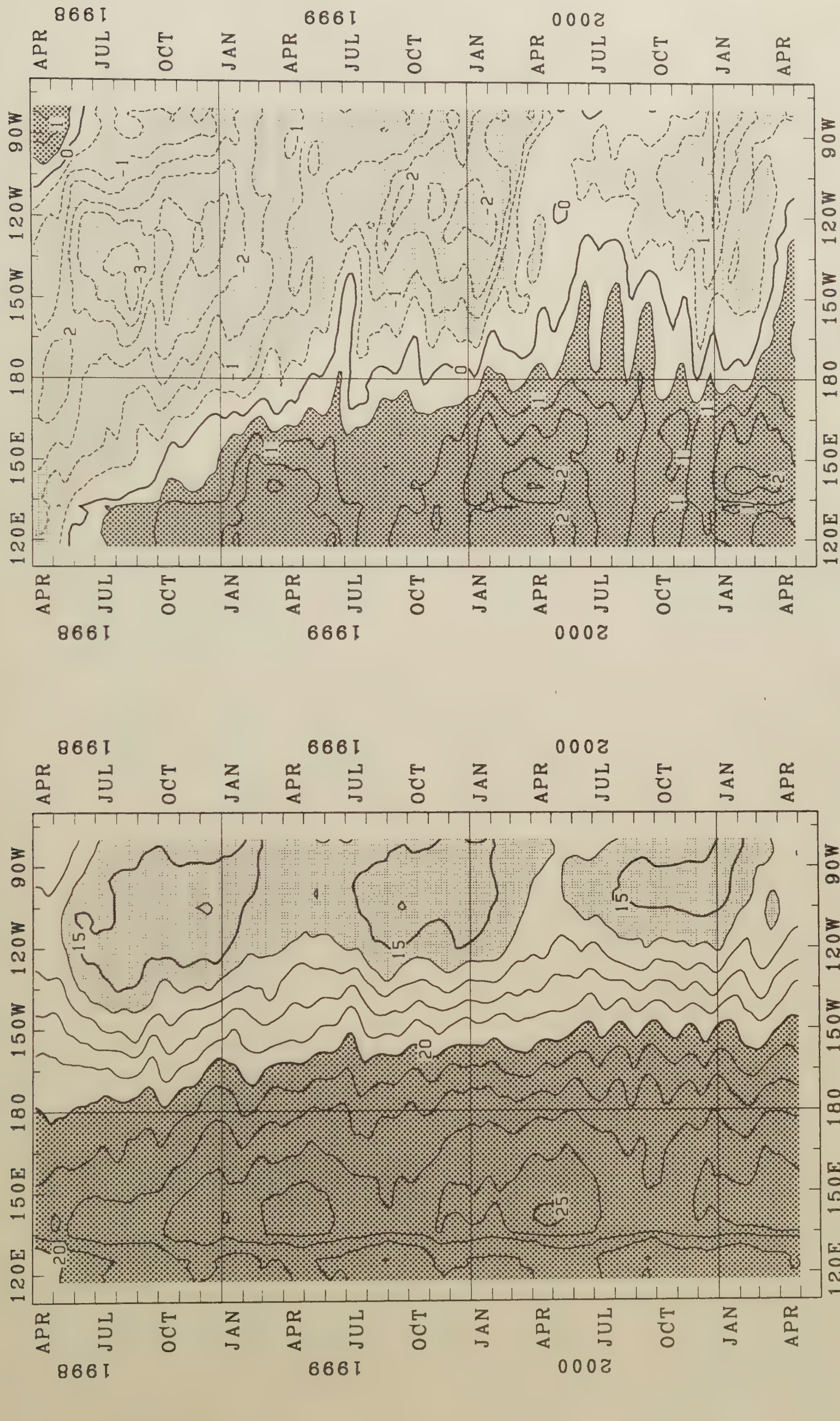
Table 1 Atmospheric and oceanic monitoring indices in the tropical Pacific Ocean



第27図　赤道に沿った海面水温（左）および偏差（右）の時間-経度断面図

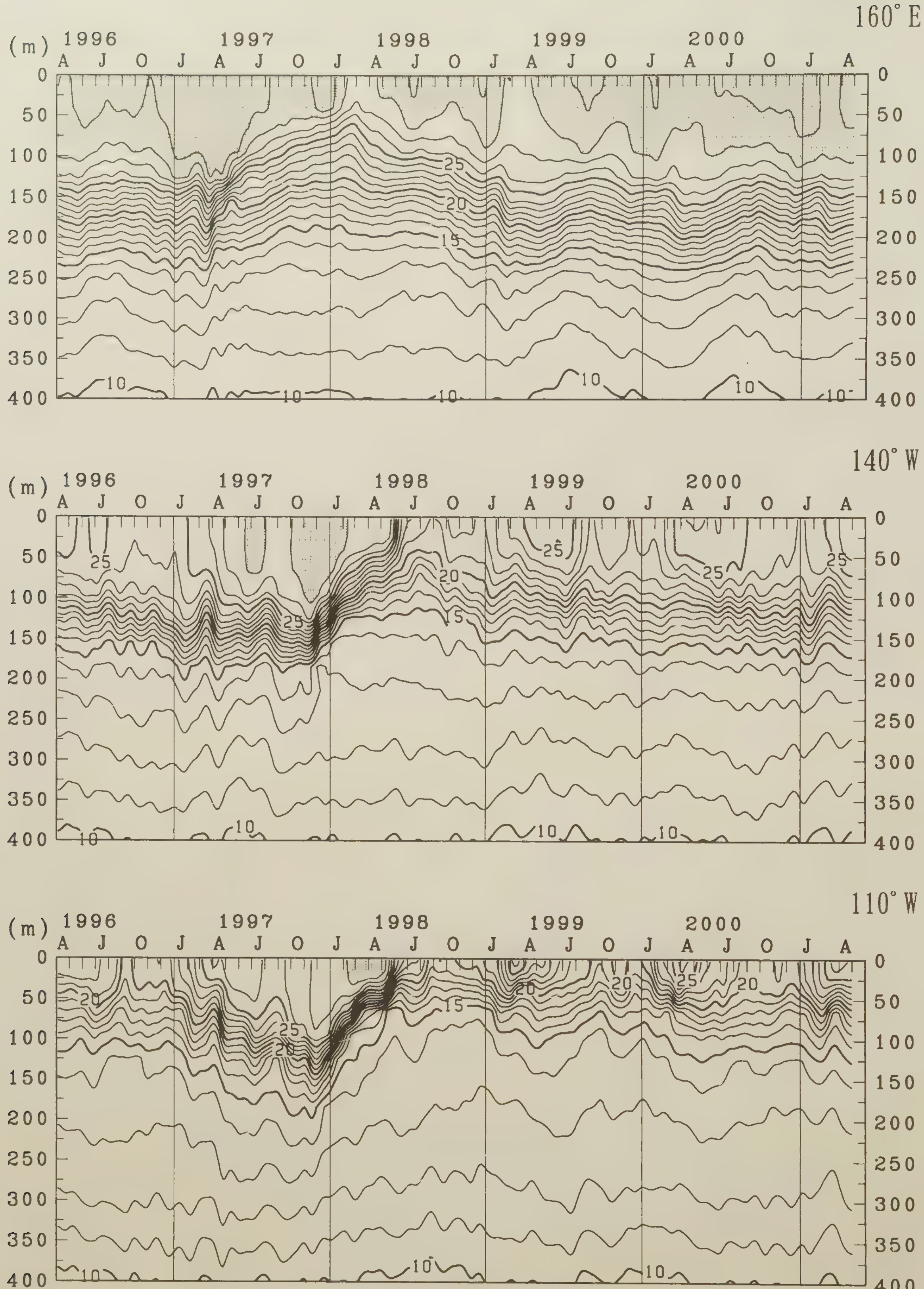
Fig. 27　Time-longitude sections of SSTs (left) and anomalies (right) along the equator (2°N-2°S) in the global ocean. Contour interval is 1°C (left) and 0.5°C (right). Values greater than 28°C are shaded and values less than 23°C are spotted in the left panel. Dashed contours indicate negative anomalies in the right panel. Anomalies are computed from 1971-2000 base period means.

Time-Longitude Sections of Ocean Heat Content & Anomalies (Eq.)



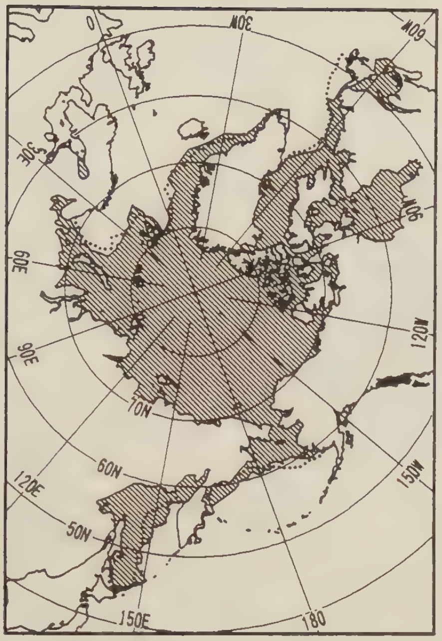
第28図　太平洋の赤道に沿う海洋表層の貯熱量（左）及び偏差（右）の時間－経度断面図

Fig. 28 Time-longitude sections of ocean heat content in the upper 260 m along the equator (left) and anomalies (right) in the Pacific Ocean. Data are derived from the Ocean Data Assimilation System of JMA. Contour interval is 1°C (left) and 0.5°C (right). Values greater than 20°C are shaded and values less than 16°C are spotted in the left panel. Dashed contours indicate negative anomalies in the right panel. Anomalies are computed from 1987-1999 base period means.



第29図　太平洋赤道域の表層水温の時間－深度断面図
（上：西部、中：中部、下：東部）

Fig. 29 Time-depth sections of equatorial subsurface temperature for the western Pacific (top, 160°E), the central Pacific (middle, 140°W) and the eastern Pacific (bottom, 110°W). Data are derived from the Ocean Data Assimilation System of JMA. Contour interval is 1°C. Values greater than 28°C are shaded.

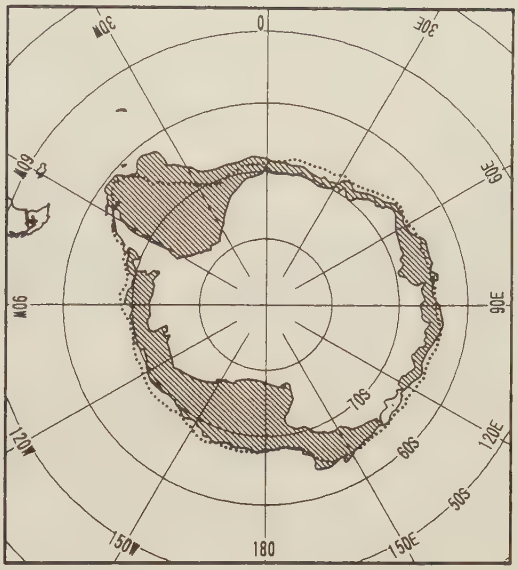


第30-1図　北極域の海氷図（2001年 4月13日）

Fig.30-1 Sea ice chart in the Arctic on 13 Apr. 2001.

The shaded area represents the sea ice extent. The dotted line denotes the mean ice edge averaged for the period from 1972 through 1990.

The data source is the National Ice Center (USA).

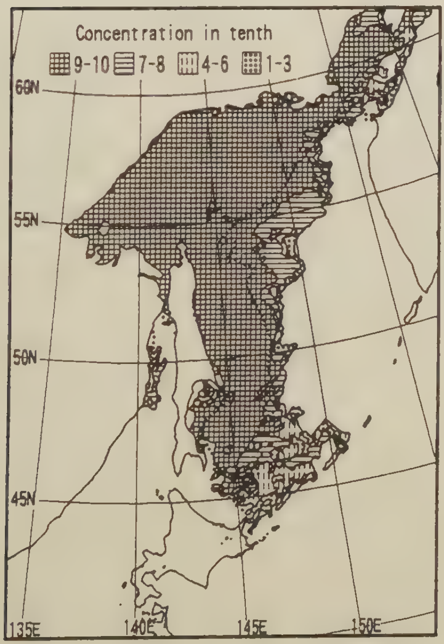


第30-2図　南極域の海氷図（2001年 4月13日）

Fig.30-2 Sea ice chart in the Antarctic on 13 Apr. 2001.

The shaded area represents the sea ice extent. The dotted line denotes the mean ice edge averaged for the period from 1973 through 1990.

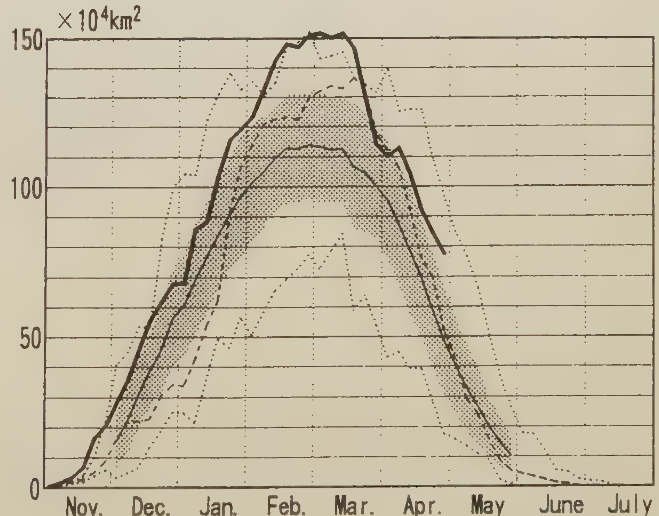
The data source is the National Ice Center (USA).



第30-3図 オホーツク海の海氷図（2001年 4月15日）

Fig.30-3 Sea ice chart in the Sea of Okhotsk on 15 Apr. 2001.

The dotted line denotes the mean ice edge averaged for the period from 1971 through 2000.



第30-4図 オホーツク海の海氷域面積

Fig.30-4 Time-series of 5-day sea ice extent in the Sea of Okhotsk.

: current season (2000/2001)

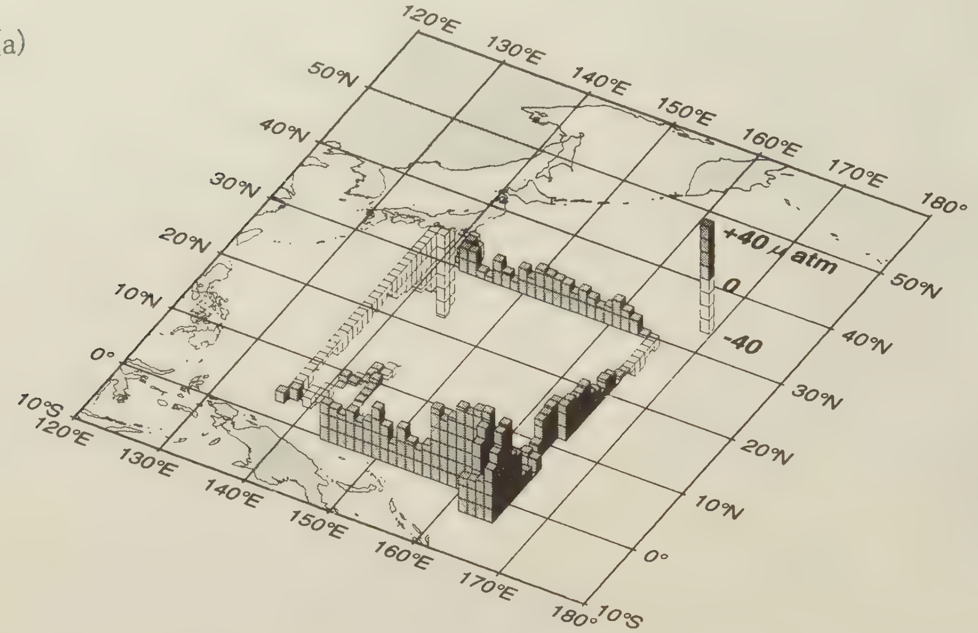
: mean extent (1971-2000)

: maximum or minimum extent (1971-2000)

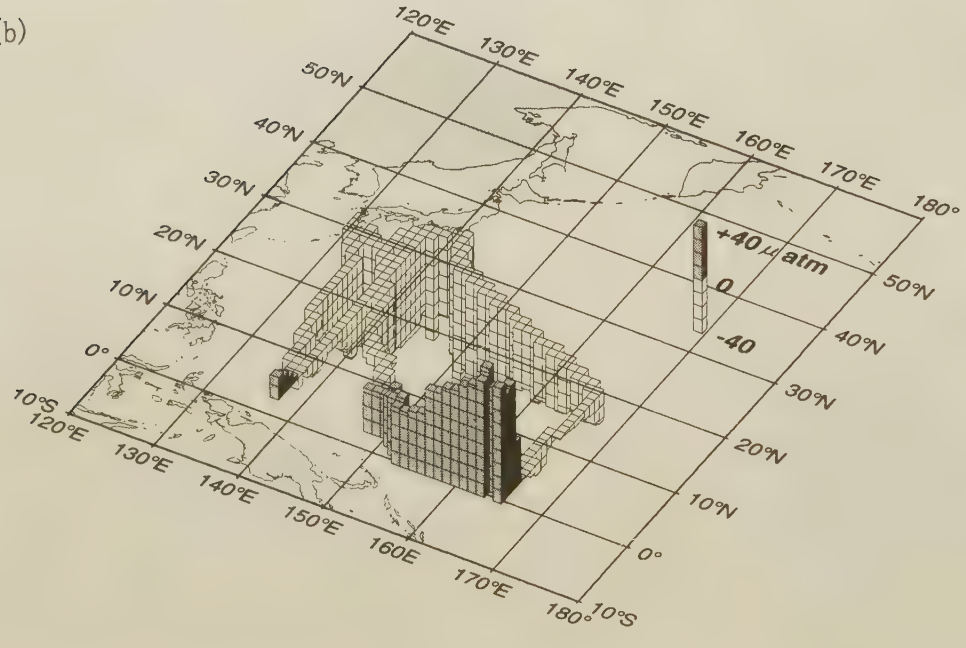
: last season (1999/2000)

: mean ± 1σ (1971-2000)

(a)

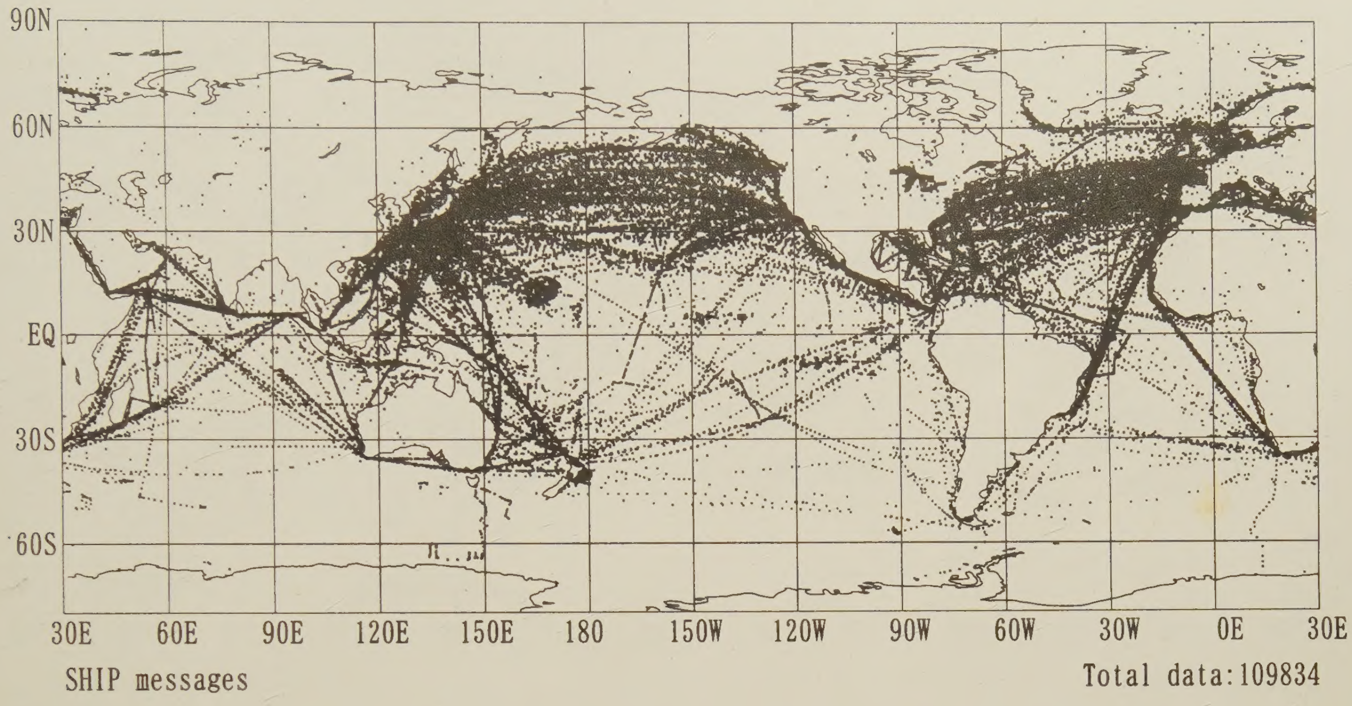


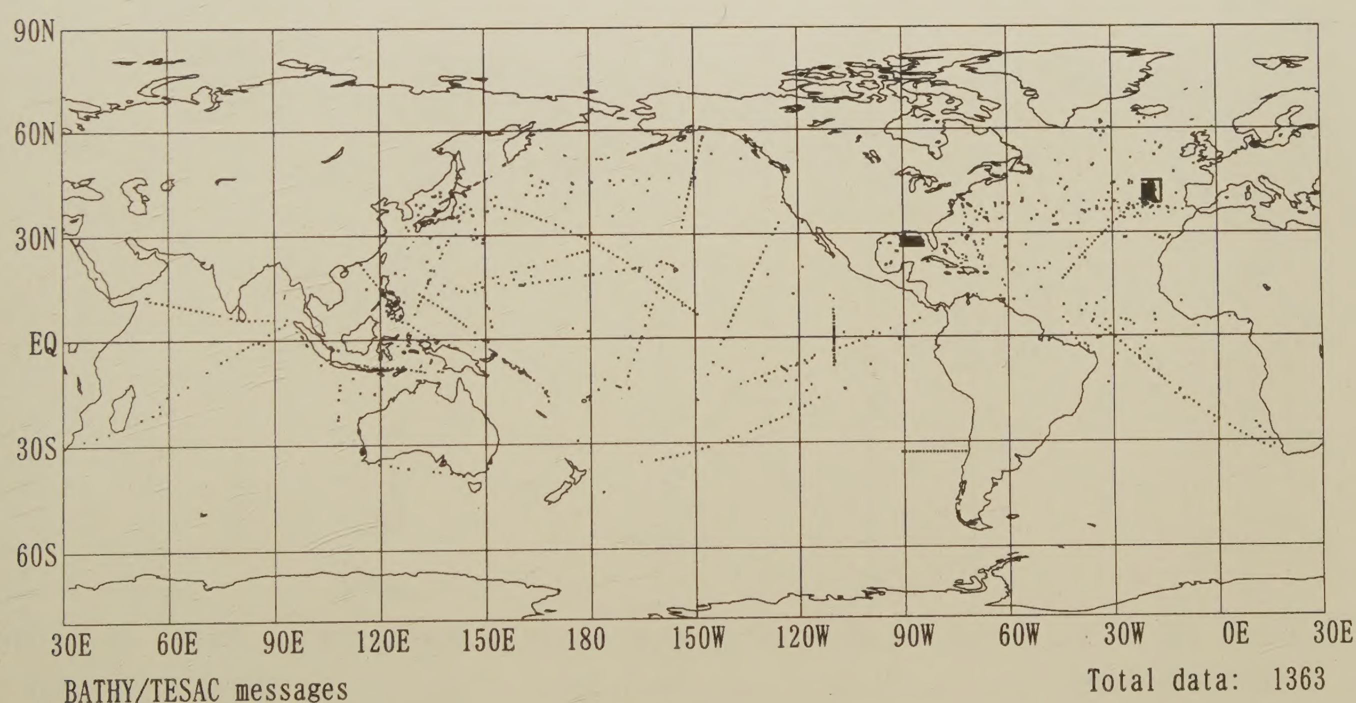
(b)



第30図　気象庁の海洋気象観測船「凌風丸」が,(a)2000年9月21日から11月16日にかけて、「凌風丸」および「啓風丸」が,(b)2001年1月20日から3月6日にかけて北西太平洋で観測した洋上大気中と表面海水中のCO_2の濃度差。棒グラフは、海洋から大気へCO_2を放出する場合を濃い陰影、海洋が大気のCO_2を吸収する場合を薄い陰影に示してある。

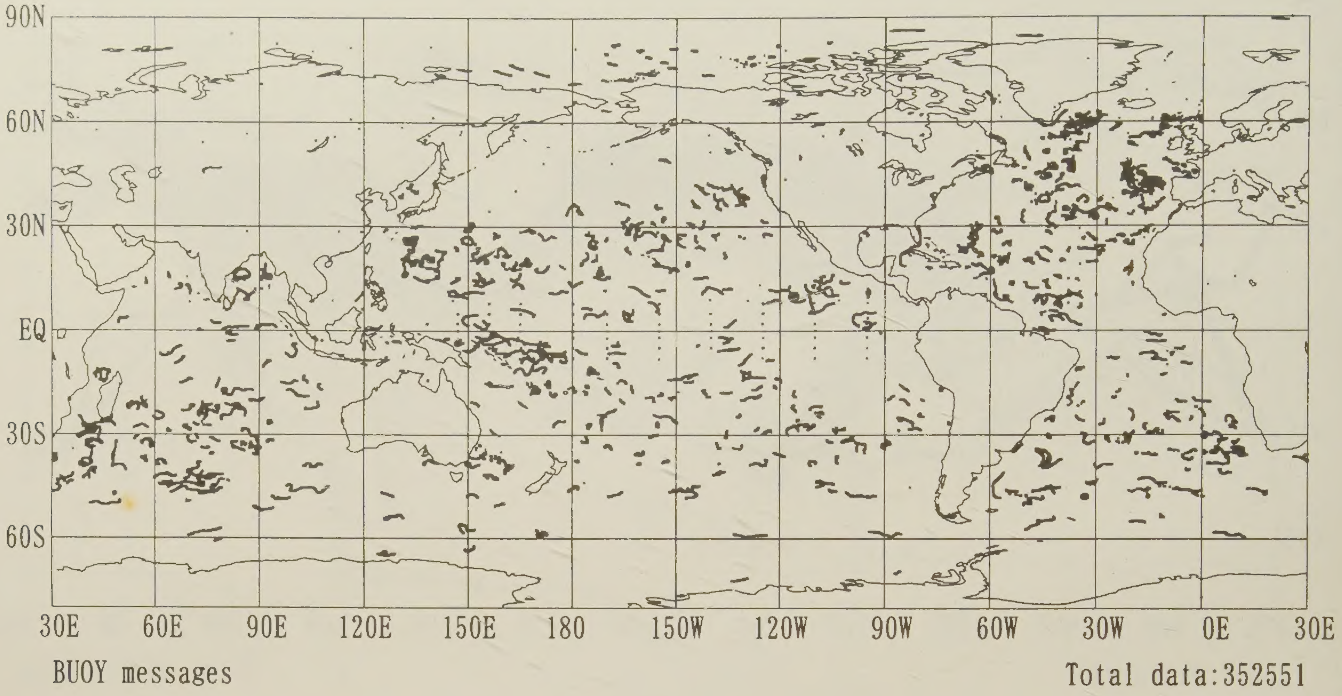
Fig. 30　Difference in the CO_2 concentration between the surface water and the overlying atmosphere in the western North Pacific observed by the R/V Ryofu Maru and the R/V Keifu Maru of JMA, (a) from September 21 to November 16, 2000, (b) from January 20 to March 6, 2001. Darker-shaded upward pillars indicate that the oceanic CO_2 was emitted into the atmosphere, and lighter-shaded downward pillars indicate that the atmospheric CO_2 was absorbed into the ocean, respectively.

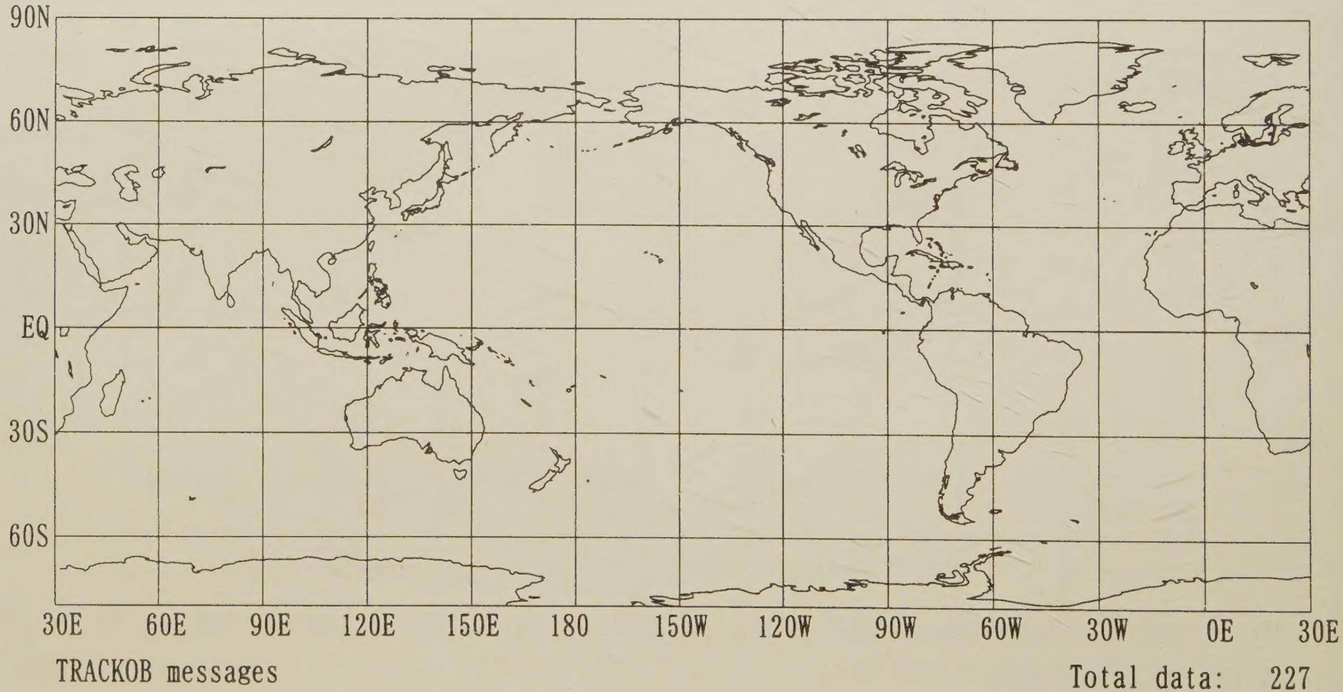




第32-1図　測点分布図(2001年 4月)

Fig. 32-1　Geographical distribution of SHIP messages (SST data, top) and BATHY/TESAC messages (subsurface temperature data, bottom) for APR 2001.





第32-2図　測点分布図(2001年 4月)

Fig. 32-2 Geographical distribution of BUOY messages (buoy drift and SST data, top) and TRACKOB messages (ship drift and SST data, bottom) for APR 2001.

気 象 庁 海 洋 月 報

Monthly Ocean Report

April 2001 (No. 100)

本月報掲載の 2001 年 4 月のプロダクトには、気象庁が観測したデータ及び GTS（全球気象通信網）を通じて入手した国際気象通報式による通報のほか、下記の機関等から提供いただいたデータを使用しています。御礼申し上げます。

防衛庁、水産庁、海上保安庁

水産総合研究センター

（社）漁業情報サービスセンター

北海道大学

水産試験場等（北海道、青森県、岩手県、宮城県、山形県、福島県、茨城県、東京都、富山県、石川県、福井県、静岡県、愛知県、三重県、京都府、兵庫県、和歌山県、鳥取県、島根県、山口県、徳島県、高知県、佐賀県、長崎県、沖縄県）

（順不同）

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